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MEDICAL AND SURGICAL SERVICE IN THE INDUSTRIAL WORLD.

S. D. SWOPE, M. D., American Refining & Smelting Co., Chihuahua, Mexico

Read before the Twelfth Annual Meeting of the Medical & Surgical Association of the Southwest, at Tucson, Ariz., Nov. 11 to 13, 1926

The rapid advance in the production of manufactured articles and the enormous increase in the size and importance of industrial institutions in the last few years, has changed the whole aspect of, and attitude towards, the subject of industrial medicine and surgery. From the individual producer and small factory personnel we have leaped into an era of employment by the thousands; mass production of manufactured articles, with transportation, housing, sanitation and health problems that were little dreamed of a few years ago, confront us on every side.

The relations of employee and employer to the medical profession have undergone so rapid an evolution that it amounts to almost a revolution of ideas. A few years back, the superintendents of our larger industrial institutions looked upon the occasional visits of the physician as necessary evils and upon the physician himself as a sort of excuse and as a renegade from the legitimate profession, from which he had drifted by reason of incompetency and necessity. His salary was in proportion to his social standing and his opinion of little value. The advancement of mechanical ingenuity, the more common use of complicated mechanical devices, the improved education of the general public, the great increase in the legal regulations defining the relations of laborer and employer and the recognition by the larger industries of the value to efficiency and production secured by employment of competent medical and surgical service, have changed the whole aspect, and today the industrial medical man is coming into his own.

The one great difference between private practice and industrial service, is the necessity of serving two masters. In consideration of our Aesculapian oath, our first duty is to the sick and wounded who may come under our care—master number one; our next duty is to our employer who feeds and clothes us with a salary—master number two. Fortunately, the service of these two masters is embodied in one procedure, for what is good for the man is also good for the master in this work. The difficulty often found here is the want of executive ability, diplomacy and medical skill, which the surgeon is required to possess and exercise in his dual capacity.

The laws of the various states and many countries have attempted to define and regulate the relations of the sick and injured employee and the interested employer. In many instances these laws are influenced by personal and political influences, leaning in favor of one side or the other in proportion to the pressure brought to bear on the law makers; but, on the whole, they tend to regulate the relations and protect the interests of both parties. With their influence, and a proper medical adviser as guide, the employer can no longer impose on the ignorance, weakness and necessities of the laborer and the designing impostor can no longer take advantage of the conscientious, considerate employer.

Indemnity laws, which at first seemed to be a terrible hardship to employers, have served to do away largely with charities and damage suits and have proved real blessings to both parties concerned.

The industrial surgeon has before him the ordinary diseases to which mankind is heir and the various special diseases incident to the occupation he follows. The workman is generally ignorant of the character and importance of his ailments. His injuries vary from an A, or no lost time accident, to an E, or death. Then we have the improvident, designing impostor to contend with. Concisely, we have constantly on our hands the sick, lame, and lazy, with

the necessity of intelligent classification. It is to our own interest, and to the interest of the afflicted and their employer, that they are relieved and returned to full duty in the shortest possible time, that we may have our duties lessened and reputations increased, that the afflicted may return to full earning power with its lessened psychoneurotic effect, that their services in the industrial machine may be resumed and the necessity of charity or indemnity stopped.

I am in the habit of classifying my afflicted in four divisions: (1) Those who are sick and know it;

(2) Those who are sick and don't know it;

(3) Those who think they are sick and are not sick;

(4) Those who know they are not sick but wish to convince us that they are.

The industrial surgeon must be a versatile man; he is often father-confessor. judge and jury and must always be a friend. He can have no specialty. He must have memorized, and be able to play at a moment's notice, the whole symphony of medicine and surgery with the allied specialties as special chords. We are intrusted with two great weapons that we should be able to wield with skill and efficiency—prevention and cure. Cooperation between management, physician and workmen is an absolute necessity for success.

The treatment of ordinary diseases differs little in industrial institutions from that of private practice, only varying with the difference of local conditions. The occupational diseases require our special attention and a superior knowledge of the subject above that of the private practitioner, since he seldom comes in contact with these affections.

Each industry has its own problems to be carefully considered and worked out. Accidents vary in character with the occupation considered. First-aid treatment and restoration of function are matters of knowledge and experience, while judgment is a personal equation of the individual practitioner.

Industrial medicine differs little in our own great southwest from that in other localities except in the character of industries and personnel of laboring classes. The production of metals in its unrefined form constitutes the largest part of our mass production industries—mining and smelting. Our workmen are largely drawn from the poorer classes of Mexican origin and are ignorant of sanitation. They are low in the scale of mentality, careless as to exposure to injury, and therefore require special attention.

In the plant where I am working in Chihuahua, Mexico, we employ regularly about fifteen hundred men. We have about one hundred accidents a month, about one-third of which are lost time accidents.

Being the largest lead smelting plant in the world—producing about 600,000 pounds of lead, silver and gold bullion each day—lead poisoning and carbon monoxide asphyxiation, with arsenical burns, require our special attention. Careful bi-monthly examinations and constant attention have reduced these ailments to a minimum far below what they have ever been before. We are now making a series of examinations of the blood of workmen employed in exposed places, for the presence of carbon monoxide in the blood, and miscroscopical and chemical examination of the blood and excretions of those exposed to lead fumes and dust, with the further anticipation of early absorption.

I feel that I cannot close this paper more appropriately than by quoting a passage from The Journal of Industrial Hygiene of January, 1926, with acknowledgement to Dr. Hertslet:

"From every point of view, humanitarian, economic, financial, and scientific, it is absolutely clear and must be increasingly recognized by those at the head of large industries, that a fully equipped medical department, where all modern methods of surgery and rehabilitation are possible, is an essential part of a properly organized concern, and forms a sound financial investment."

TREATMENT OF FRACTURES OF ELBOW AND FOREARM

R. L. RAMEY, M. D.
El Paso, Texas

Read at the Twelfth Annual Meeting of the Medical & Surgical Association of the Southwest, held at Tucson, Ariz., Nov. 11 to 13, 1926.

I will mention some of the most common fractures of elbow and forearm. They are the epiphysis of the humerus; the external and internal condyles; T and Y fractures involving the joint, the coranoid process and head of radius and olecranon. Of the forearm: Colle's, in which only the radius is involved; chauffeur's fracture, which occurs from cranking automobiles. Then there is another type which, as a rule, are produced by greater violence, in which both bones are broken and the soft parts often severely contused. Fractures of the fore-

arm may involve either the elbow or wrist joint.

The important point in the treatment of fractures of the elbow and forearm is to get good function. I mean by good function satisfactory flexion and extention of the elbow, pronation and supination of the forearm. The most common causes of loss of function of the elbow are injuries involving the joint, with a great amount of callus, loose pieces of bone, or severe contusion.

The most common cause of loss of function of the forearm is not getting the bones thoroughly separated. This often happens in fractures involving both bones, the callus extending from one bone to the other, converting them into one, as it were, rendering pronation and supination impossible. Comminution of the bones is also a cause of this condition.

We should remember, in dealing with fractures of the forearm, that the radius is much more important than the ulna at the articulation with the wrist; and the reverse is true of the articulation with the elbow, the ulna being the more important by far.

There is no definite rule for the treatment of fractures; each case is a law unto itself. For instance, we must know whether the fracture is simple, compound or comminuted, whether there is a great amount of contusion or injury to soft parts, whether there is joint involvement, and the amount and character of displacement; all of which can be fairly well determined by a careful examination and by x-ray.

There are certain rules that should be followed in the treatment of these cases. If we have a compound fracture, it should be regarded as a dirty wound. If a small or punctured wound, the opening should be enlarged and thoroughly cleansed. For this I prefer ether poured into the wound, followed by mercurochrome or iodine, and if there is little or no injury to soft parts, close it up; otherwise, leave it open.

If there is much contusion or swelling of the parts, apply splints loosely and use hot applications until the swelling is reduced. The greatest mistake that is often made in the treatment of fractures is, in my opinion, the application of tight dressings; they are uncomfortable, keep the parts swollen and interfere with repair.

If there is much displacement, it is always better to give your patient a general anesthetic as you can make a better examination and get better reduction of the parts. This can best be done under the fluoroscope.

It is my custom, in nearly all fractures of the elbow, to supinate the forearm and put it up at acute flexion with the arm held in position by adhesive plaster. Passive motion should be undertaken not later than ten to fifteen days after reduction. Exceptions to this rule are fractures of the olecranon, which should be put up straight or at right angles, according to position of the fragments.

In fractures of the lower forearm, I like the ordinary anterior and posterior wooden splints with an extra pad, or pads, to retain the bones in proper position with the arm in mid-supination, thereby separating the bones as widely as possible. This splint should always immobilize the wrist joint. We usually use this splint for one week and then put on permanent dressing of plaster of Paris. If the fracture is higher up, and especially if both bones are involved, then the elbow, as well as the wrist, should be immobilized with plaster cast. There are fractures, however, sometimes requiring operative procedures, in which we have loose pieces of bone fractured off, such as a piece of the condyle or epicondyle or the head of the radius, which can not be replaced and interfere with the fracture of the joint and have to be removed. Also there are fissural fractures of the lower end of the humerus into the joint, with wide separation, which you have to fix with some foreign material to avoid an excess amount of callus. With bones of the forearm, surgical interference is most often needed when both bones are broken and you are unable to get the proper separation. In this case, if you plate the radius you will have but little trouble in getting a satisfactory position of the ulna, and put on a plaster of Paris splint. Fractures of the arm involving the wrist joint also sometimes require open operation. In these cases we should use the simplest appliances and disturb the soft parts as little as possible.

SUMMARY

1. Give a general anesthetic if the fracture cannot be easily reduced.
2. Manipulate bones as gently as possible.
3. Use the dressings you are most familiar with; do not try out every new appliance that comes along.
4. Never apply your dressings tightly.
5. Watch circulation of hand after reduction.
6. We never put on a circular plaster splint without cutting it through with wire saw.
7. Never do an open operation if you can get satisfactory function without it.

IMMEDIATE MANAGEMENT OF INJURIES OF THE BACK

JOHN E. BACON, M. D., F. A. C. S., and WM. B. WATTS, Jr., M. D.
Miami Inspiration Hospital, Miami, Ariz.

Read before the Twelfth Annual Meeting of the Medical-Surgical Association of the Southwest, held at Tucson, Ariz., Nov. 11 to 13, 1926.

This paper is inspired by a request for information as to the management of severe injuries of the back from the time of the accident up to, and through, the period required for diagnosis. That it is a very pertinent inquiry is revealed by the fact that an application for abstracts, made to one of the largest medical service bureaus in the country, brought forth about twenty-five abstracts of articles dealing with diagnosis and treatment, but not one dealing with the way an injured person should be handled immediately after the accident, how transported to the hospital or home, and how handled during the process of diagnosis. We have a fairly large library which is also silent on the subject and one of us recently attended the meeting of the American College of Surgeons at Montreal, during which an entire day was devoted to a symposium on Industrial Surgery, covering all its aspects except this one, so that it seems as though one of the most important periods in the history of an accident is universally ignored.

In our industrial work, which has to do with injuries received in and about mines, shops and haulage systems, we have found that a thorough training in modern first aid is of the greatest value and a first-class investment. Our organizations have found it well worth while to employ a full-time, well paid, thoroughly trained engineer to instruct all the bosses and as large a number of the men as possible, in the elements of first aid and the transportation of injured men. This policy has been found of particular value in management of injuries to the back.

With the tremendous increase in the number of injuries to the back, caused by "beating the train to the crossing" and "the other fellow to the corner," and the greater number still to occur with the steady increase in the number of automobiles; what to do when the accident occurs must be taught to increasingly larger numbers of people, and, as usual, the doctor must be the missionary in this as in every other line of endeavor contributing to the health, safety and comfort of the people.

A missionary, however, must be fairly grounded in the elements of what he is to teach, and, therefore, a resume of what experience has taught the profession in this work should be presented frequently to impress us all with the duty we have of improving the kind of preliminary care these injured people are getting.

Fractures of the pelvis and of the transverse processes of the vertebrae are much more common than we used to believe, as shown by accumulating radiographic statistics. Fractures of the bodies of the vertebrae are also more common than we are still inclined to believe. They can, and do, occur with no signs at all (see Case 1, below), or with so little apparent shock and so few symptoms that some of them are overlooked entirely until symptoms occurring months, or years, later, reveal the fact (Case 2). Therefore, we believe that, when an injury has occurred accompanied by forcible bending forward of the body or jack-knifing, or of sufficient violence to have possibly caused a fracture of the spine, the case should be treated as one of fracture until the diagnosis is complete.

1. G. Q., Mexican, miner, aged 24, on October 9, 1923, was caught beneath muck which sloughed from the roof of a drift. There were contusions and abrasions of both scapular regions, and of the entire lumbar region; x-ray examination revealed fractures of the left transverse processes of the first, second and third lumbar vertebrae, and the right transverse process of the second lumbar. There was a compression fracture of the first lumbar vertebra sufficient to produce a moderate wedge-shaped deformity of the body. We were unable to get this man to stay in bed, and, after a few days treatment, he insisted on being returned to work. He was given a release on the twenty-seventh day after his injury. He has worked steadily ever since and has not complained of symptoms referable to the injury of his back. This case is cited to show that a compression fracture may exist without symptoms or physical signs indicative of such a lesion.

2. G. H., American, farmer, aged 38, came to us for examination in September, 1923, one year after an accident in which he was jack-knifed beneath a hayrack. For about two weeks following the injury he could not do heavy lifting; after this period he resumed his usual duties, but was always conscious of "soreness" in his back. About six months from the date of injury a small lump appeared over his lower dorsal region; the pain, disability and deformity steadily increased, and he finally decided to consult a doctor. When seen by us there was a well-defined kyphosis at the level of the ninth dorsal vertebra, tenderness to pressure, and immobility of the eighth, ninth and tenth dorsal vertebrae. X-ray examination revealed an extreme wedge-shaped deformity of the ninth dorsal. He was referred to an orthopedic surgeon for treatment but decided that he could not give up the time required, and in March, 1925, developed a complete motor and sensory paralysis of both legs, incontinence of urine and feces, and anesthesia extending to the level of his umbilicus. We have included this case for the purpose of pointing out the possible late developments in untreated "crush fractures."

The usual procedure after an accident is to send hurry calls for several doctors—all very well in its way, since a hypodermic of morphine is nearly always required, but

beyond that, in the absence of wounds and bleeding, the doctor is just as helpless as any other individual in the crowd unless he has had the forethought to ask for an ambulance to follow at once. The proper thing to do is to take the patient to the nearest, or best, hospital in such a manner as will not increase the damage already done. To crowd a patient with a fracture of spine or pelvis, into the back seat of an ordinary car, in the name of speed, is entirely wrong. Such patient should be stretched out flat, covered up, kept warm, and not moved until a stretcher can be secured, or one improvised, and then transported in an ambulance or a truck to the hospital, or, if necessary, to the home. It is bad practice to grab him by heels and head in lifting him to the stretcher. The body should be lifted horizontally by the method taught in first aid classes, to minimize movement in the fractured parts.

On arrival at the hospital it is not unusual for the patient to be turned from side to side in giving a bath or moved from stretcher to x-ray table and back again to bed, with scant regard for the nature of the lesion. Here, again, all cases must be regarded as fractures until definitely found not to be, and turning, rotation and bending of the body should not be done. No one can ever know the amount of extra avoidable damage that has been so inflicted.

Stereoscopic roentgenograms can be made without damage and will yield information sufficient to proceed with proper immediate treatment, and will indicate to the surgeon and roentgenologist the feasibility of turning a patient on the side for the purpose of obtaining a lateral film. The indiscriminate practice of turning a patient on his side regardless of pain and without preliminary knowledge of the extent of the lesion, cannot be too strongly condemned. Such procedure may be the cause of increased bleeding into the neural canal and of movements in the fracture area that will do more damage in a few minutes than the doctor can ever undo. The patient should be lifted on a strong blanket or canvas sheet, by many hands, and so transferred without bending the body. It occurs to the writers that the flat top Bucky diaphragm is a great improvement over the original curved-top diaphragm, and suggests the possibility of being mounted on an upright stand for the purpose of obtaining lateral views of a spine without the slightest inconvenience or hazard to your patient.

We regard the air mattress or water mattress as almost indispensable in the care of these cases. The care of the skin, which is of so much importance, is made much easier for the patient, as the soft mattress can be pushed away in selected places without turning the patient, and it is clear that the pressure is evenly distributed over the skin of the back. Even if it is necessary to apply a cast or the double-shell cast of Osgood, still the air cushion is most desirable. We have employed the air mattress in all of our cases of fracture of vertebral bodies and have found that, in most of the cases, the plaster cast may be omitted until it is desired to get the patient up.

The next point of importance is that there is no great need of immediate surgical interference and that a careful study of the patient as a whole will repay the effort. Concomitant lesions may be discovered. The neurological findings will give information as to the site and gravity of the lesion in the spine. The reaction observed will yield an estimate of the probable course of the case, and of the resistance of the patient. The only indication for immediate laminectomy is an evident increasing paralysis due to hemorrhage within the dura, or for depressed fracture of the arch if revealed by x-ray.

In an experience covering fifty-two fractures of the vertebrae, of which ten were of the bodies, we have found no occasion to do any surgery, and do not regret our decisions in the light of the subsequent progress of these ten cases. Nine of them were fractures of hyperflexion (jack-knifing) and one was caused by a fall, landing on the feet. Of these ten cases, three died within a few days from associated lesions. Two which presented total paraplegia due to lateral displacement of fractured vertebrae, have partially recovered, but are unable to work. One has returned to light work. Three have resumed their regular duties. One is still under treatment, progressing satisfactorily.

A detailed report of the fifty-two cases of fractures of the spine, with discussion of causes, symptoms, diagnosis and treatment will be presented in a subsequent paper.

SUMMARY

Fractures of the spine and pelvis are becoming more common, due to greater use of the automobile, and should be suspected in every case of injury to the back.

Educational work by our profession, concerning the immediate care and transportation of such cases, is needed. All of these cases require hospital care and radiographic study.

Every hospital should be equipped, to aid the surgeon responsible for this work, with

adequate x-ray apparatus, air or water mattresses, special table for plaster casts and special operating facilities for operation when required.

HEAD INJURIES WITH EAR SYMPTOMS

F. P. SCHUSTER, M. D.
El Paso, Texas

Read before the Twelfth Annual Meeting of the Medical & Surgical Association of the Southwest, held at Tucson, Ariz., Nov. 11 to 13, 1926.

About forty per cent of all head injuries produce ear symptoms. These are impaired hearing, dizziness, tinnitus and nystagmus, which not only occur at the time of injury but, in those cases which do not terminate fatally, may persist indefinitely or throughout life. As a result, a certain amount of disability is produced, especially in occupations requiring perfect hearing and balanced mechanism. The industrial surgeon is frequently called upon to estimate this disability and to distinguish between real organic pathology and functional disturbances variously called neurasthenia, occupational neuroses, hysteria and malingering. This may be extremely difficult to do, but, after a careful consideration of the mechanism and pathology of the injury, and the checking up of the subjective complaints with objective tests, we are usually able to arrive at a fair estimate.

I shall discuss three phases of head injuries:

1. Concussion of the brain with ear symptoms;

2. Concussion of the brain combined with concussion of the labyrinth;

3. Concussion of the brain combined with fracture of the skull.

CONCUSSION OF THE BRAIN WITH EAR SYMPTOMS

Let us consider for a moment the mechanism and pathology of concussion of the brain with inner ear symptoms.

When a blow is received on the head, the skull, being an elastic body, has the force transmitted to its contents—that is, the brain, spinal fluid and vessels. There is produced an acute augmentation of intracranial pressure. The effect of this on the brain substance is a compression.

The effect of the acute augmentation of intracranial pressure on the spinal fluid is to force it out of the lateral ventricle through the third and fourth ventricles, toward the central cannal of the spinal cord, which is very small in caliber and dams back the fluid. This back pressure compresses the floor of the fourth ventricle, producing microscopic hemorrhages and, later, degenerative changes in the vestibular nuclei.

The effect of the increased pressure on the blood vessels, is to produce a momentary compression followed by a changed circulation, characterized by the fact that the blood flows slower through enlarged or dilated vessels. This is due to a vasomotor change and is termed praestatic blood circulation. It results in exudation and leukocytosis about the vessels. These facts have recently been established by experimental studies on animals and by microscopic postmortem studies in man, principally by workers in the Vienna clinic. The greatest part of aural symptoms of concussion are produced by this praestatic circulation. Of utmost importance, however, is the fact that this condition is often permanent, lasting throughout life, and it continues to produce symptoms. Consequently, in concussion of the brain, we frequently find symptoms of persistent intermittent attacks of dizziness coming on without apparent reason, nystagmus, and, at times, tinnitus. There is a notable absence of impaired hearing apparatus. When this pathology can be demonstrated clinically, the prognosis of concussion is not good, because the attacks of dizziness tend to persist throughout life.

The disability has been estimated in France, in Austria and in Germany at around forty per cent and even higher, if the occupation requires a perfect balance mechanism. Such a case is cited from the medico-legal standpoint, by H. Joliet, of Paris. Following concussion of the brain without fracture, the patient presented deafness, headache, tinnitus, vertigo and a changed visual field. The incapacity was estimated at forty per cent, which, however, was later reduced to twenty per cent because it was proved the patient was not in perfect physical condition previous to his injury.

CONCUSSION OF THE BRAIN COMBINED WITH CONCUSSION OF THE INNER EAR.

By concussion of the inner ear, we refer to all changes found in the inner ear following head injury without fracture. These changes are always secondary to concussion of the brain. The ductus endolymphaticus and the internal auditory meatus are the points where concussion of the brain affects the inner ear. The increased spinal fluid pressure produces, momentarily, a faster lymph current in the inner ear. Therefore the resultant symptoms are momentary. The effect on the blood vessels of the ear, however, is similar to that

produced in the brain—that is, a praestatic circulation with a slower blood current through the dilated vessels and consequent exudation and leukocytosis. It is this exudation in the ear spaces which produces the symptoms. The pathology is similar to a vasomotor rhinitis and is easier to demonstrate by objective tests. The symptoms produced depend on the amount and location of the exudation. Thus, we have four types of clinical pictures produced:

(1) If the exudate is in the perilymphatic spaces only, there are no vestibular symptoms, but in the cochlea there is an interference with sound conduction and a middle ear type of deafness is the result.

(2) If the exudation is in the peri- and endo-lymphatic spaces, there are produced spontaneous symptoms of dizziness and nystagmus, in addition to the middle ear deafness.

(3) If this exudate persists over a long period of time, we get, in addition to a secondary inner ear type of deafness, an absence of caloric vestibular response, but the labyrinth may still react to the stronger turning tests.

(4) Finally, this may produce a complete deafness, with absence of both caloric and turning responses.

The case reported by Field of complete traumatic destruction of vestibular function, with slight coincident cochlear involvement, is probably of the first or second type.

The prognosis of concussion of the brain, with concussion of the labyrinth, is not good. If hearing is impaired following injury, it is usually not only permanent, but also progressive. Tinnitus is severe and very difficult to relieve. Dizziness tends to recur in attacks. The disability estimate is but slightly higher than for simple concussion and varies according to the occupation.

CONCUSSION OF THE BRAIN WITH FRACTURE OF THE SKULL.

Fractures involving the temporal bone may be extensions of fractures of other portions of the skull and, hence, the etiology is, in general, the same as for skull fractures.

Briefly, they may be produced (1) by indirect violence, as by radiation of a blow or fraction from the vertex; (2) by direct violence, as from penetrating wounds and blows transmitted through the condyles of the jaws or through the vertebral column.

The temporal bone fractures in a rather typical manner so that we may distinguish three types as follows: (1) longitudinal fracture; (2) crossing fracture; (3) fracture of tip of the pyramid. Each type has its characteristic course, symptoms and prognosis.

The longitudinal fracture typically extends from the tegmen tympani to the anterior surface of the pyramid and ends in the anterior or middle fossa. It is the most common fracture of the base of the skull alone without complication. It is much more frequent than diagnosed in life and even at postmortem, as the fracture may be found, at times, only on microscopic examination. It is typically a middle ear fracture and produces a middle ear type of hearing impairment. The diagnosis is often difficult, as the x-ray is usually negative and blood in the middle ear may occur without fracture. Spinal fluid from the ear is the only absolute sign.

Prognosis is not good because fractures of the petrous portion of the temporal bone do not heal well. Cases have been examined microscopically thirty years after injury with almost no callus or healing. This means we practically have a permanent communication from the middle ear to the meninges.

The crossing fracture starts in the posterior fossa, extends to the jugular bulb across the pyramid and ends there. It always destroys the roof of the vestibule because this is the weak spot. The cochlea and semi-circular canals may therefore escape injury, but are usually destroyed by the hemorrhage. If the lateral labyrinth wall is fractured, it is between the oval and round windows. This fracture is usually seen on x-ray.

The prognosis is bad because, as a rule, (1) this type is produced by severe injury, and (2) because the respiratory and cardiac centers lie in the post fossa. If the lateral labyrinth wall is ruptured, we have a direct communication from the middle ear into the inner ear. However, if this is not the case and the patient does not die in forty-eight hours from the fracture, the danger of late infection is not so great as in longitudinal fracture. As to hearing, deafness is complete and permanent and no irritability of vestibule is present.

Rupture of the tip of the pyramid is practically always part of the so-called ring fracture due to violence transmitted to the base of the vertebral column. This occurs in falling from a height and hitting on the feet or sacrum, and is part of a ring fracture of the base. As the vestibulum is not involved, there are no otologic symptoms, as a rule. Diagnosis of this fracture is usually made by the x-ray. The prognosis, being part of a ring fracture, is bad.

The diagnosis of the presence of these varied pathological processes in head injury cases with ear symptoms, therefore, is of the utmost importance in estimating the disability. While time does not permit a detailed discussion of the varied symptomatology, the diagnostic points we may briefly summarize, as follows:

SUMMARY

Concussion of the brain with ear symptoms is characterized pathologically by degenerative changes in the vestibular nuclei. The chief symptom is dizziness, which is not continual but intermittent in attacks and without apparent reason. The caloric tests reveal normal irritability of the labyrinth, or, relatively often, hyper-irritability. Spontaneous nystagmus may be present, but not intensive and not continual. There are no cochlear symptoms.

Concussion of the brain, combined with concussion of the inner ear, is characterized pathologically by otitis vasomotoria, producing a picture of serous otitis interna, but, of course, with absence of bacteria. Depending on the location and amount of exudation, we have clinically a varied picture which may be grouped under four types:

Type 1—Exudate in the perilymphatic spaces only, producing middle ear type of deafness with no labyrinth symptoms.

Type 2—A middle ear deafness with spontaneous labyrinth symptoms of nystagmus and dizziness.

Type 3—Middle and inner ear deafness, with spontaneous labyrinth symptoms, no caloric irritability but positive turning reaction.

Type 4—Middle and inner ear deafness, spontaneous labyrinth symptoms, no caloric and no turning irritability.

In temporal bone fracture, we have three types:

1—Longitudinal or middle ear type, fair or good hearing remaining, with great danger from late infection.

2—The crossing or inner ear type, with deafness and little danger of late infeciion.

3—The type of ring fracture, with no otologic symptoms.

The differential diagnosis between these organic lesions and the various functional neuroses and malingering, requires keen observation, as well as judgment in evaluating the symptoms present. Benese calls attention to the vasomotor instability in neurotic patients giving responses similar to organic lesions. In these cases we are aided by the observations of Kerrison, Dench, Leider, Loewy, Alexander and others, on the frequent hyper-irritability of the cochlea, which rapidly fatigues, the hyper-irritability and profuse visceral reactions produced by labyrinth stimulation, which are not present in organic lesions, and, being reflex or objective, cannot be perfectly simulated by the malingerer.

In conclusion, I wish to call attention to the slight tendencies of fractures of the temporal bone to heal, with consequent menace to the patient's life from infection. In concussion of the brain, with or without fracture, we frequently have permanent pathological processes set up; namely, praestatic blood circulation, which produces a chain of symptoms greatly affecting the patient's ability to continue in gainful occupation.

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A PLEA FOR MORE GENERAL POST-OPERATIVE USE OF THE DUODENAL TUBE.

W. L. BROWN, M. D., and C. P. BROWN, M. D.,
El Paso, Texas

Read before the Twelfth Annual Meeting of the Medical & Surgical Association of the Southwest, held at Tucson, Ariz., Nov. 11 to 13, 1926.

Experimental workers and surgeons have been devoting much thought and investigation to the duodenum and upper jejunum in the intoxications brought about by intestinal stasis and obstruction, from whatever cause.

The experimental work of Draper[1], Whipple, Stone and Bernheim[2], MacCallum and associates[3], Haden and Orr[4], and McCann shows the duodenum to be the toxic zone in intestinal obstruction, whether adynamic or mechanical in nature.

As to the character of the toxins, the experimenters have not all agreed, but as to the location of their production there is quite uniform agreement—that it is in the duodenum and upper jejunum.

Many leading surgeons have recognized this "segment of toxicity" of Whipple's and have undertaken to meet the issue by doing an entero-enterostomy in anterior gastro-enterostomy and all other operations tending to produce stasis in the duodenum. They have also advocated jejunostomy drainage in intestinal obstruction, resections, peritonitis, and other cases in which there is likely to be intestinal stasis, toxemia, and gaseous distention.

In the more serious cases, at the time of the original operation, or at some time later, as circumstances demanded, they have done jejunostomy, suturing a tube in place, doing direct drainage of the loop. In the milder cases they have resorted to the repeated use of the stomach tube.

We now venture to suggest that the condition can be met in both the mild and severe cases by continuous stomach drainage with the duodenal tube. Five years experience with it in the treatment of postoperative abdominal complications has furnished us convincing proof of its great value and ever increasing range of application.

We are more confirmed in our belief that these toxins, formed in the duodenum and jejunum, are constantly regurgitated into the stomach. The character of the fluid withdrawn from the stomach and the rapidity with which it reforms, would strongly indicate that the great bulk of it was regurgitated; also, the fact that some of the most profound toxic cases of peritonitis and intestinal obstruction in which early dissolution was imminent, have been relieved of their vomiting, distention, and toxemia by stomach drainage, and have lived in comparative comfort for a week. This is probably all that a surgical drainage of jejunum could have accomplished. In other words, these cases have not died from the early formation of toxins in the "toxic loop," but have finally died of a toxemia produced by the dissolution of the tissues at the site of pathology.

This is well illustrated in the case of a woman, fifty years of age, operated upon for intestinal obstruction. When the peritoneum was opened the intestines were found to be very dark, greatly distended, and free pus from the peritoneal cavity poured out over the sides of the wound. She was so toxic and had such rapid pulse that it was not considered worth while to undertake any exploration, so we hurried to get her off the table. The duodenal tube was passed before she left the operating room, and an enormous quantity of foul-smelling, dark fluid was removed from the stomach, and the tube left in place. For the first twenty-four hours she drained a large amount of fluid of the same character, her distention subsided, and her general condition improved. Her symptoms were so relieved by the second or third day that we could hardly believe what we had seen. Drainage was continued, and she lived seven days without further distention or vomiting. Postmortem showed that her pelvis and the lower part of the abdomen were full of pus, and much of the intestine was practically gangrenous. In this instance it relieved the emergency and kept her alive until she died from a pathological source far removed from the duodenum.

That the relief afforded with the tube is so decided that it may be misleading as to the progress of the pathology is illustrated by the case of a boy, eight years of age, who had a traumatic rupture of the small intestine, which was sutured within a few hours after the accident. Drainage of the peritoneal cavity was established and later, when distention and vomiting began, the use of the duodenal tube was instituted. It was removed after a few hours, but the child begged to have it reinserted. His symptoms of distention and vomiting were so completely relieved that the symptoms of mechanical obstruction were overlooked. Postmortem showed that agglutination of loops at the site of the trauma had caused a mechanical obstruction, and local gangrene had finally ensued.

There are many postoperative abdominal cases, where the local pathology has not progressed far enough to endanger life, from which the patient would recover if he could be relieved of the early toxemia from the duodenal loop caused by intestinal stasis.

The duodenal tube gives the gravely ill patient, who is fighting two antagonists (his local pathology and his duodenal toxemia), relief from the toxemia, thereby leaving his entire forces free to fight the pathology.

In cases of perforated appendicitis with a greater or less amount of peritonitis, in conjunction with Fowler's position, Murphy's drip, and Ochsner's massive, hot applications, it is the treatment **par excellence**, and it is in this class of cases that it saves the most lives, as they are the most common. We are firmly convinced that it,

and it alone, has saved life in these desperate conditions.

In the less frequent cases of mechanical intestinal obstruction, it relieves the toxemia, stops the vomiting, and certainly gives the patient every opportunity to overcome the effects of the obstruction after operation.

Many times, in operations on the stomach and intestines, in order to prevent distention and vomiting, we insert the tube before the patient leaves the operating table.

A patient now in the hospital, who has had two previous operations and each time vomited for three days, was, this last time, given the duodenal tube before she left the operating table. She didn't vomit that day, but vomited a small amount twice during the night. The tube was removed the following morning, she became nauseated and insisted upon its return, and then wouldn't give it up until the third day, as she stated that it had been such a relief to her that she didn't mind the annoyance of its presence.

In all stomach operation, such as resections, ulcers, and gastro-enterostomies, we pass the tube before the patient leaves the table and leave it in place for from twenty-four to forty-eight hours. In these cases the stomach is kept empty by aspiration and frequent washings with sterile water.

More recently, we are inclined to pass the tube and aspirate the fluid contents of the stomach before the operation is begun.

The large quantity of fluid present at operation, in a twelve-hour fasting stomach, is always surprising. In a recent case—a resection of an ulcer, and gastro-enterostomy—we withdrew a pint and a half of dark-looking fluid before the patient left the table.

Many times in cases of obstruction and peritonitis we have been able to withdraw a quart of fluid from the stomach, although the patient was constantly vomiting. In other words, vomiting does not mean that the stomach has been emptied of either fluids or gas. In fact, we have inserted the tube and been able to hear the escaping gas all over the room, although the patient had just been vomiting.

In cases of difficult abdominal hernias, or other hernias, where we wish to guard our suture line from the effects of vomiting, we pass the tube on the table and leave it in place until the period of vomiting is over. If the patient is sufficiently out of the anesthetic to swallow, there is usually very little trouble in passing the tube.

When inserting the tube at the end of operation before the patient is sufficiently awake to swallow, and because of the dryness of the throat, we find vaseline a more satisfactory lubricant than the lighter oils, as it is more adherent to the tube. Also, in these cases where the patient is still asleep, we never inject any water until we have withdrawn stomach contents, which assures us that the tube is not in the air passages, nor curled up in the esophagus. In either case, injecting water might be of serious consequence.

We find that we are using the tube more often in all kinds of abdominal operations where there is any undue distention or vomiting. The relief is frequently so marked, and the patient is given so much comfort, that he begs to have the tube returned if he once experiences a few hours drainage.

Dr. James T. Case, of Battle Creek, cured a serious case of duodenal fistula with constant duodenal tube drainage after all other known remedies had failed.

By making possible duodenal feeding and the introduction of fluids, it gave remarkable results in one case following carbolic acid poisoning, where there was constant vomiting. It might also be used in other forms of corrosive poisoning, under like circumstances.

After the use of five per cent cocaine on an applicator, we pass the tube through the nose now always because it is less irritating to the throat, cannot be bitten, and is not in the way during an anesthetic. It should be passed to the first mark only as it will curl up in the stomach if too much is inserted, and therefore may not empty the stomach of either fluid or gas. The medium size Levine tube, number 14, seems to be the most satisfactory for general use.

The longest we have ever left the tube in place was seven days. It sometimes becomes irritating to the throat and nose, under which circumstances it may be removed and re-inserted later.

Ordinarily it is left hanging by the side of the bed, the patient is given an abundance of water to drink and the water is allowed to siphon off. After improvement ensues and it appears that the patient would retain the water, the tube is hung up on the head of the bed to stop siphonage. It should be let down again and the stomach aspirated immediately if nausea occurs.

The tube accomplishes the following: 1. It relieves conditions due to gas and regurgitated intestinal fluids. It is a vent pipe. 2. It effects interrupted or continuous lavage of the stomach, and, in some

cases, of the duodenum. 3. It gives relief from nausea. 4. It makes possible the free drinking of water and thereby relieves that most distressing symptom, thirst. 5. It permits transgastric feeding. 6. It relieves toxemia. 7. It is a port of entry for all kinds of medication. 8. It improves the feelings of the patients; they often beg for its return after they have once experienced the relief afforded by its use.

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PYELITIS OF PREGNANCY
With Report of Cases

WILLIAM ROSS JAMIESON, M. D.
El Paso, Texas.

Read before the Twelfth Annual Meeting of the Medical & Surgical Association of the Southwest, held at Tucson, Ariz., Nov. 11 to 13, 1926.

Infection of the renal pelvis is a much more frequent complication of pregnancy and the puerperium than is generally supposed. The symptoms presented frequently simulate other acute inflammatory conditions of the abdomen and chest, giving rise to numerous errors in diagnosis.

In 1893, Reblaub (Congres. franc. de chirurgie, proces. verb., Paris, 6:692) reported several cases and thus brought the subject before the profession. In 1905, Opitz, (Ztschr. f. Geburtsh. u. Gyn., 1905) presented a very complete review of the subject.

ETIOLOGY

A great deal of discussion has arisen as to the causation of this condition. Some investigators contend that it is due to the pressure of the pregnant uterus on the ureter, where it crosses the pelvic brim. Others are equally certain that it is caused by elongation of the ureters with kinking and torsion. Halbertsma has shown by experiments on dogs that a weight of 5 grams compressing the ureter over a surface of 8 millimeters is sufficient to prevent the flow of a volume of urine weighing 400 grams. He is a protagonist of the first theory. On the other hand, De Lee asserts that, as the specific gravity of the pregnant uterus is about the same as that of the intestinal mass, pressure of the pregnant uterus on the ureter is not the cause of ureteral obstruction in this condition.

Be it as it may, the underlying cause of renal infection in pregnancy is obstruction of the ureter, with resulting renal stasis forming a breeding ground for bacteria.

PATHOLOGY

On account of the low mortality of this condition, the material is comparatively scanty. In cases examined and reported in literature, the ureter was found to be dilated and elongated, the walls thinned out and the mucous membrane hyperemic. In some cases, there was marked elongation of the ureter with a mobile kidney, producing a decided kinking. In a few cases this kinking was so pronounced that, even after pregnancy was terminated, the urine was unable to pass. The renal pelvis was enlarged, sometimes markedly, with walls thickened and sclerosed and covered with a thick purulent debris or a white tenacious exudate. The kidney substance was pale and anemic, with, in some cases, a marked atrophy of the renal substance. (Williamson, Kidney Diseases, Herringham, 1912.)

BACTERIOLOGY

The principal offenders in these cases are the various members of the coliform group. The infection is nearly always hematogenous, in all probability gaining entrance to the circulation through some small lesion of the alimentary canal.

Cabot and Crabtree assert that in the beginning of pyelitis or pyelonephritis, due to B. coli, the bacteria can be demonstrated in the blood stream. Even in cases where the infection may have taken place along the course of the lumen of the ureter, owing to an incompetent uretero-vesical valve, or from lymphatic extension, they were able to recover the bacilli from the circulation, causing them seriously to doubt the occurrence of renal infection without the intervention of the blood stream.

The greatest number of cases of renal infection occur before the fifth and the sixth month of gestation. During this period the gravid uterus is rising out of the pelvis, resting upon the brim thereof and compressing the ureter between it and the brim.

SYMPTOMS

The great variety of symptoms presented in the onset and subsequent course of the

disease, are responsible in a great measure for the errors of diagnosis in this condition.

Williamson (Herringham, Kidney Diseases, 1912) divides the initial symptoms into six groups, as follows:

1. The earliest symptom is often slight intermittent pain over the loin, probably due to distention of the renal pelvis. This is usually followed by malaise, headache, pallor, constipation and slight irregular rise of temperature, corresponding to the blocking of the ureter and retention of pus in the renal pelvis. The tongue is coated and sweats are fairly common. There is some tenderness over the kidney region and a sense of discomfort in the loin.

2. The onset is sudden with acute lumbar pain, followed quickly by temperature and rising pulse, rigors, vomiting, headache, malaise and sweats.

3. The initial symptoms are high fever, malaise, etc., without any symptoms referable to the kidney.

4. Frequency, urgency and painful urination are the first to be noticed, followed in a longer or shorter interval by pain in the lumbar region and evidences of toxemia.

5. In rare cases, there is a sudden onset with abdominal pain, persistent vomiting, absolute constipation and distention.

6. Occasionally there are symptoms resembling those of pleurisy or pneumonia affecting the base of the lung. These are worse on respiration, particularly deep inspiration. Temperature and pulse rise, there is vomiting and hurried breathing.

About 60 per cent of the cases of pyelitis and pyelonephritis of pregnancy can be classified in Group 2.

Pain: This is the most striking symptom in nearly all cases. It is usually felt over the lumbar region, and varies from a dull ache to the agony suggestive of the passage of a stone. In the latter case, it may extend over a wide area, along the ureter to the front of the abdomen. When the pain is localized in the iliac fossa, it may give rise to a diagnosis of appendicitis. Ranging upward, it may simulate pleurisy and pneumonia. In rare cases, there may be pleuritic symptoms confirmed by the clinical findings, due to contiguous inflammation, or simultaneous infection.

But in the majority of cases the pain is felt in the region of the affected kidney or kidneys, if the condition is bilateral, extending towards the groin of the affected side. Occasionally, it is colicky in type.

Temperature: The next symptom of importance is the elevation of temperature. This is irregular, being sometimes continuous, sometimes remittent and sometimes intermittent. When there is obstruction to the flow of purulent urine, there is usually a rapid rise in temperature, sometimes preceded by a chill, which usually subsides when the flow is reestablished. The pulse rate varies with the temperature. In the milder cases it ranges around 100, but in the severe it may go to 130 or more.

Vomiting: As in other forms of kidney irritation, an exacerbation of pain may be accompanied by vomting. It may also precede the onset of the pain, even by a day or two.

Abdominal Distention: This is a very troublesome and distressing feature of the disease. When it is associated with persistent vomiting, it may lead to a diagnosis of intestinal obstruction.

Urinary Symptoms: Frequency, burning and urgency may be present, but in some cases are not nearly as noticeable as would be supposed judging by the amount of purulent urine passing through the bladder. As in all nephritic cases, the urine, at first, is high colored, scanty and of high specific gravity. It is very turbid and, on standing, deposits a heavy sediment. On microscopical examination, the field is found to be filled with bacteria, pus cells, varying in amount, epithelia, leucocytes and red cells. When the accompanying nephritis is pronounced, epithelial, hyaline and even granular casts may be present.

Blood Examination: It must be remembered that normally in pregnancy there is an increase in the white cells. This rarely runs above 10,000 per c. mm. In pyelonephritis there is usually a leucocytosis which is not very high considering the acuteness of the inflammatory process, running about 12,000 to 14,000 per c. mm. However, it must be borne in mind that the absence of a leucocytosis does not rule out the presence of pus in the kidney.

Physical Examination: In many cases there is distention of the abdomen with rigidity of the muscles of the affected side. Palpation of the kidney is difficult, but tenderness can usually be elicited by first percussion over the affected organ and palpation of the costo-vertebral angle. A point of great tenderness is often found around McBurney's point, giving rise to suspicions of appendicitis. Digital examination per vaginam will usually detect tenderness in the fornix where the ureter can be felt entering the bladder.

Cystoscopic examination with catheterization of the ureters, will definitely establish the diagnosis. The phthalein test will usually show that the efficiency of the af-

fected kidney is lowered as evidenced by diminished excretion and increased appearance time.

DIAGNOSIS

The three principal symptoms encountered in pyelitis and pyelonephritis are pain, temperature and pus in the urine. Whenever a pregnant woman presents the first two, the physician should immediately look for the third. In addition, there are general malaise, furred tongue, frequency, painful micturition, constipation and irregular temperature, which is usually not very high. The sequence of events in acute appendicitis is to be remembered; viz., pain, nausea, vomiting and temperature. In renal infection of pregnancy, pain and temperature are present always, but nausea and vomiting are comparatively rare. In the latter the muscular rigidity of the abdomen is usually absent, or, if present, is not nearly so pronounced.

If there is the slightest doubt as to the diagnosis, a cystoscopic examination will give the most valuable information.

TREATMENT

The first essential of treatment is that of other inflammatory conditions, rest in bed. The patient should receive a purge of calomel, podophyllin, followed by a saline. Copious draughts of water should be given and even forced on the patient. In the treatment of the B. coli infection, various and sundry remedies have been advocated. Hexamethylenamin, combined with sodii phosphate, 2 to 3 grams daily, sometimes gives results. Oftentimes a change from an acid to an alkaline medication will be advantageous. Mercurochrome intravenously in from 10 to 25 c. c. of a 1 per cent solution, is advocated, but cannot be too long continued for fear of salivation. In addition, the injection is usually followed by an intense reaction which may frighten the patient and her friends. Caprokol in my hands has not given the slightest benefit in B. coli infections. In the two cases to be mentioned later, it seemed to me that the best results followed the use of salihexin intravenously. This is given every day until its effects begin to be apparent, then every second day. At times there is a reaction following its use, but it is usually mild.

In obstinate cases the insertion of a catheter to the pelvis of the kidney, and its retention there for several days, is the best remedy, providing, as it does, constant drainage of the diseased organ.

One of the most essential parts of the treatment is the diet. In the early stages, when the symptoms are acute, the diet should be easily assimilated and non-irritating. In all acute infectious diseases the high temperature is often responsible for an increased tissue waste. Therefore, it stands to reason that the patient should receive as much, if not more, nourishment, in order that sufficient calories be taken to balance the output. For a woman weighing 130 pounds a diet should be arranged that will provide her with 2400 calories. This should include enough proteids to give a minimum of 70 to 80 grams daily. Milk, on account of its easy digestibility, would seem on first thought to be the ideal food, but it is subject to two objections; viz., used exclusively it gives too much proteid, or, if kept within bounds, it does not provide enough nourishment. One quart of milk will provide 640 calories, so that to get from 2400 to 3000 calories, four or five quarts of milk, containing 140 to 175 grams of proteid, will be given, which is entirely too much.

Inquiring into the relative caloric value of foods suitable for cases of pyelonephritis, it is found that cream, while containing a little more albumin than milk, has a high caloric value, sufficient to nourish the patient, and yet give her the minimum proteid requirement. One quart of 20 per cent cream contains 2200 calories, with less than 40 grams of albumin. Given in the form of cream soups, on cereals and bread, or combined with aerated waters, it is very palatable. Sugar, given in the form of cane or milk sugar, gives four calories to the gram. A diet containing two quarts of milk, to which has been added one ounce of milk sugar to each glassful, will provide 2280 calories. One slice of bread (100 calories), half an ounce of butter (100), cereal and cream (200), will furnish the balance of calories necessary.

As the patient improves, the diet can be increased. An egg or two can be added daily, in place of some of the milk. Later lean meat, chicken, etc., will give a pleasant addition to the bill of fare. In all forms of nephritis there is no objection to the free use of carbohydrates and fats, and during the period of proteid restriction they should be given freely. Salads with oil dressing, jellies, fruits cooked with sugar, etc., have a high caloric value, are free from proteid and may be given in acute nephritic conditions.

The following cases are reported, on account of the severity of the symptoms:

Mrs. R., 37, white, American, married, entered Hotel Dieu on April 30, 1926, at 4:30 a. m. for delivery, in the service of Dr. Branch Craige. On

admission, her temperature was 104, pulse 160 and respirations 24. Delivery took place at 7:30 a. m.

She gave a history of an attack of ear trouble one month before. She stated that Dr. W. J. Davis had operated on it and that it had discharged freely for some time after. During the month previous to confinement she had temperature off and on.

Urinalysis, made April 30, showed albumin, granular casts and epithelia, but no pus. The high temperature persisted. On May 5th, the white blood count was 13,400 with 83 per cent polynuclears, and albumin, granular and hyaline casts, and pus were present. One week later, pus was still present and the temperature had ranged from 98 to 105.2 degrees. On May 17th, the white blood count had fallen to 10,200 with 74 per cent polynuclears. Paratyphoid A and B and typhoid, were absent. The course of the disease was practically the same until May 24th, when I saw her first. Then temperature was 104; pulse, 110. Her appearance was that of a very sick woman. Face was sallow, tongue coated, abdomen quite distended, with marked tenderness over the right kidney region, following the ureter to the front of the abdomen. Catheterization of the ureters showed pus and epithelial cells from the right kidney. The urine from the left kidney was negative. Culture of the urine from the right side showed B. coli. The catheter was left in the right kidney pelvis, but was pulled out by the nurse next morning. The catheter was reinserted on the 27th, and left until June 1st. During that period the kidney pelvis was washed out daily with mercurochrome 1 per cent. The temperature, which had been 103 before inserting the catheter, dropped to 98 the next day and did not rise above 101.6 while it remained in place. She did fairly well until June 7th, when she began to complain of severe pain in lumbosacral region and along the course of the right sciatic nerve, the slightest movement bringing on paroxysms of pain.

From June 12th intravenous injections of mercurochrome were given every second day for four doses, but had to be stopped as mercurial stomatitis was produced. During the administration of the mercurochrome, the temperature was as erratic as ever. On June 22nd, the intravenous injection of salihexin was begun. Twelve doses were given, two days apart. The temperature gradually receded, the pus slowly disappeared, the appetite improved and, with it, the general strength. On July 17th, the patient was discharged. The sciatic pain took quite a long time to disappear, and even yet she walks with a slight limp.

Mrs. R., 24, Mexican, mother of one child and pregnant five months with second, was admitted to the City and County Hospital on July 6, 1926. On admittance, temperature was 99; pulse, 100; respiration, 26.

She complained of great pain in right kidney region and right iliac fossa, frequency and burning on micturition.

She was a pale, sallow, emaciated woman, evidently in great distress.

There was marked tenderness over the right kidney on first percussion and in the right costovertebral angle on palpation. No enlargement of the kidney could be made out. Temperature was irregular, varying from 99 to 105 and accompanied by chills and sweats.

Catheterization of the ureters showed pus from the right side which gave culture of B. coli. There was no appearance of phthalein from either side, in fifteen minutes. This was probably due to the nurse refusing to give water under the idea that she was going to receive another anesthetic. The catheter was left in twenty-four hours and temperature fell rapidly, but soared when catheter was removed. On the 17th, it was reinserted and left for five days and the kidney pelvis was washed daily with mercurochrome 1 per cent. She was given an ampule of salihexin daily for fourteen doses. Discharged July 23rd.

These two cases are similar in the irregular temperature, which sometimes reached 105, the pain over the kidney region and in the iliac fossa. But in one case there was no frequency, unless urination every three hours or so under forced administration of fluids can be called such. In the latter, the frequency was as much as every fifteen minutes.

SUMMARY

Temperature or abdominal pain in a pregnant woman should at once lead to an examination of the urine. But it should be borne in mind that it should be a catheterized specimen from the bladder, as the vaginal discharge, always present, may mislead.

In obstinate cases, drainage of the kidney pelvis for days at a time and washing out the pelvis daily, will give the best of results.

Special attention must be paid to the diet, that an already weakened kidney may not be overloaded and yet the patient receive the necessary nutriment.

Internal medication is best given intravenously.

THE EFFECT OF THE MENSTRUAL CYCLE ON BASAL METABOLISM.

FRANK J. MILLOY, M. D.
Phoenix, Arizona

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This paper is written with the intention of reviewing the literature on the subject of the effect of the menstrual cycle on basal metabolism and to report in detail two cases which seem to vary somewhat from the general impression obtained from the literature. While the literature on the subject of the relation between the ovary and thyroid is voluminous; on the other hand, the literature of this particular phase of the subject is most extremely scarce.

A request from two abstracting services resulted in three references on this subject—all abstracts of articles from foreign journals—and one other reference to two American authors who have tried to approach this subject by studying the sugar metabolism during the menstrual cycle. According to them, after making 300 blood sugar determinations covering forty-nine menstrual periods in twenty-six normal

women, there seems to be no ground for conclusion that there is a constant cyclic variation in the fasting blood-sugar level. The average values observed during menstruation are slightly higher than those for the intermenstrual period. However, there are a great number not only of higher values, but also of lower values, during the menstrual period, than at any other time. The ingestion of 1.75 gm. of glucose per kilo of body weight has, however, led, in ten cases observed, not only to smaller initial increases in blood sugar, but also to a greater degree of secondary hypoglycemia during the menstrual period than at any other time of the month. The effect noted immediately before and immediately after this time is just the opposite, that is, a lessened tolerance, while the ingestion of glucose in the intermenstrual period has an intermediate effect. This smaller increase and greater decrease in blood-sugar following glucose ingestion during menstruation, suggests an altered functioning of the pancreas, coincident with the time of menstruation. Speculation as to whether or not this is the result of an altered ovarian or suprarenal secretion seems hardly justified by the evidence at hand. The only conclusion is that, in making single determinations of blood sugar for purposes of clinical diagnosis, the time of the menstrual period should, in as far as possible, be avoided.

Wiltshire, of London, undertook a series of experiments comparing the physiologic processes in the menstrual and intermenstrual periods. The points chosen for determination were: (1) the basal metabolic rate of normal women during menstruation and between menstrual periods; (2) the cost to the organism of a certain definite piece of work; and (3) the rate of recovery from that work. The observations were made on five subjects, the basal metabolism being determined each day during the menstrual periods and three or four times between these periods. The results obtained showed that the basal metabolism was not appreciably affected by menstruation. The cost of work to the organism and the rate of recovery from work, were the same during the menstrual and intermenstrual periods. The author concludes that, while more experiments must be done before any definite conclusions can be drawn, the processes appear to be identical during the menstrual and intermenstrual periods.

The German investigator, Lanz, has noted that basal metabolism increased towards the end of the interval and during the premenstruum, and attained its lowest point during the postmenstruum and at the outset of the interval.

The course assumed by curves thus recorded is declared to correspond to that of the curve of development of the corpus luteum, a fact which is said to indicate that impulses which govern variations proceed from the latter. These impulses are described as slight in healthy individuals, and as pronounced in sufferers from certain diseases (tuberculosis in the initial stage, for example), particularly when accompanied by disturbances of internal secretions.

The two cases reported in detail are as follows:

CASE 1. L. B., school teacher; aged 30; first examined, August, 1921. Chief complaint, weakness. History: The patient has been nervous and weak for ten years. Weakness has been accompanied by rapid pulse, nervousness, pains and aches in the lower limbs. Four years ago, she had scarlet fever; has been much worse and unable to work ever since. Nervousness and rapid pulse and pains in lower limbs have been becoming worse all the time. A year and a half ago, she had a severe cold, coughed some, but raised no sputum. Had slight temperature, 99 to 99.2, which existed for a year. Spent several months in a tuberculosis sanitarium, although told by a very excellent chest specialist that she did not have pulmonary tuberculosis. Previous illness: mumps and influenza. Menstrual history began at 12; regular duration 4 days; profuse. Some months there were severe pains and, other months, no pains at all. Family history: Father and mother living, two brothers living. Father has high blood-pressure; no history of tuberculosis in family.

Physical examination: Patient is a moderately developed, poorly nourished female, about 30 years of age, who does not seem very ill; no external manisfestations of nervousness. Teeth look good and x-ray shows no infection. Tonsils are small and buried, but contain some infection; tongue not coated. No exophthalmos; von Graefe's and Stellwag's signs both absent. Thyroid is palable and uniformly enlarged, but enlargement is not detectable by inspection. Lungs are negative to both physical and x-ray examination. Pulse, bounding; rate, 120. Heart action, heaving and forcible; apex is one finger's breadth inside the mammary line both sounds are present, snapping and brittle; no murmurs; capillary pulse easily detected. Abdomen retracted, no tenderness; right kidney palable; knee jerks and Achilles' reflexes, all present and equal. Eyes react quickly to light and accommodation. There is marked tremor of fingers of both hands. Basal metabolism, plus 27. Urine and blood examinations, all within normal limits. Kidney function, first hour 50 per cent; second hour, 20 per cent. Provocative Wassermann, negative. Spinal fluid: no increase in pressure; cell count, 2; no excessive protein; colloidal gold and Wassermann tests, both negative. This was before the introduction of iodine-therapy by Plummer. This patient showed no response to rest and bromides, nor to ovarian and corpus luteum therapy.

April 10, 1922, thyroidectomy was performed under nitrous oxide-oxygen-novocain anesthesia; and two-thirds of left lobe and four-fifths of right one, removed. Patient made a good recovery and left the hospital in one week. After operation, pains and aches in legs were completely relived, nervousness very much better; pulse rate decreased some except

under nervous excitement. But extreme weakness still persisted, and was always very much worse during menstrual period. December, 1922, basal metabolism was plus 14. Patient recovered sufficiently to do relief teaching during school year 1923-24. As symptoms were always aggravated during menstrual period, an artificial menopause was induced by x-ray during 1924. During the school year 1924-25, patient did not miss a day from teaching during the entire year. In June, 1925, basal metabolism was minus 14, and February, 1926, minus 12. This patient seems to be gradually recovering although progress is very slow at times.

CASE 2. S. M. C., female, aged 36; entered hospital Dec. 10, 1925. Had just finished menstruating; feeling badly since November menstruation. Chief complaint: feeling of weakness; pain in chest; rapid pulse; and palpitation of heart, especially noticeable on going to bed at night.

Physical examination: Patient is a small, moderately developed, well nourished female; weight, 120 pounds. Head is negative; tonsils are small, cryptic, buried, and contain cheesy material. Teeth are artificial; tongue is clear; thyroid gland is not palpable; lungs are normal both to physical and x-ray examination. Heart; apex is one finger's breadth inside mammary line; no enlargement; bounding and forcible; rate is 120 to 130; both sounds are present and snapping; no murmurs; capillary pulse plainly visible. Abdomen is negative; no tremor of the fingers. Patient does not think she is nervous. Dec. 17, 1925, basal metabolism was plus 43; patent did not care to go to bed. Lugol's solution was given, 10 minims three times a day for two weeks. She feels much better and symptoms have practically disappeared except that pulse rate continues around 100, and she has noticed loss of weight. Menstruated, January 6th, much more easily than in December. January 14th, had a severe attack of palpitation of heart at bedtime and collapsed; pulse went to 140. Basal metabolism on January 29th, plus 11. In spite of this reduction of 25 in the metabolism rate, patient did not feel any better and pulse continued 100 to 120. She menstruated February 6, and had very severe cramps and pains in back lasting 36 hours; suffered more than ever. Basal metabolism, February 13, plus 25. At this time we debated between surgery and x-ray treatment. Decided on x-ray and to x-ray ovaries first, not with intention of suppressing menses completely, but to reduce it. Two x-ray treatments were given ovaries, February 14 and March 4, respectively. The patient felt much better after these treatments and seemed much improved; pulse came down to 80. These x-ray treatments were the only thing which gave ony relief from her symptoms during her entire period of illness, up to time of operation, except during first month when Lugol's solution relieved her, although Lugol's solution reduced metabolism every time it was given. But when the March menstrual period approached, symptoms recurred again. March 8, basal metabolism was plus 54. She had pains in breasts and felt like menstruating but no cramps and no flow until March 15th. Patient has been taking Lugol's solution, 15 minims, three times a day, continuously. She is unable to take larger doses on account of gastro-intestinal symptoms. Basal metabolism, March 23, plus 42. During this time. although basal metabolism has varied within a wide range, symptoms have been gradually becoming worse.

At this time the patient left the hosptilal and went to another city where she remained for four months, during which time she did not receive any iodine and had a tonsillectomy performed. She returned to hospital July 19th. Physical examination at this time showed loss in weight of 32 pounds. Patient is extremely nervous; has marked tremor of fingers of both hands. Pulse rate is 120. Examination of heart shows no enalrgement; no murmurs; beat is bounding and both sounds are sharp and brittle. Blood-pressure is 100-80; no exophthalmos; von Graefe's and Stellwag's signs, both negative. Tongue is trembling, slightly coated. Left lobe of thyroid is palpable, which may be due to loss of fat in this region; no bruit present. Abdomen, distended; patient has been alternating between diarrhea and constipation; succussion sound very marked over upper abdomen. Patient is extremely nervous and is continually moving both upper and lower limbs. There is marked mental depression at times. She sleeps very little. Blood count still normal. Basal metabolism, plus 60. She nas not menstruated since March. Lugol's solution was given again, 20 minims, three times a day. Basal metabolism, August 2, plus 36; August 13, plus 33; August 19, plus 33. Sugar tolerance test at this time showed a curve at its highest point, .2 per cent at the end of two hours. August 20, thyroidectomy was performed under nitrous oxide-oxygen-novocain anesthesia. When thyroid was exposed, both lobes were enlarged about twice their normal size. Three-fourths of each lobe, along with isthmus was removed. Uneventful recovery from operation followed. Lugol's solution, 10 minims once daily was given for eight weeks. Basal metabolism, September 3, plus 18; October 30, plus 7. All symptoms have subsided with the exception of some abdominal discomfort which is still persistent. Pulse rate is 70 to 80. Patient has gained 15 pounds since operation. Pathological sections of both these thyroid glands shows marked and extensive hyperplasia of epithelium lining the acini. Diagnosis, toxic goiter in both cases.

Summarizing these two cases briefly: Case 1 represents a slow chronic course of a toxic goiter in which, at first examination, the basal metabolism was plus 27. After the removal of almost the entire gland, the basal metabolism was still plus 14 with some of the symptoms still persisting. Improvement was at a stand-still six months after the operation, and continued so until the artificial menopause was induced by x-ray of the ovaries, which, in turn, reduced the basal metabolism to a minus 14, and has resulted in further very marked improvement in this patient's condition.

Case 2 represents an acute fulminating course of a toxic goiter, in which the basal metabolic curve is directly opposite to the curve arrived at by Lanz. He stated that the curve increases toward the end of the interval and during the premenstruum, and attained its lowest point during the postmenstruum and at the outset of the interval. While, in this case, the curve was always lowest at the outset of the premenstruum and toward the end of the menstrual cycle, and at the outset of the interval the curve was at its highest. On the other hand case 2 might be called a simple case of acute hyperthyroidism with symptoms very much aggravated during the menstrual cycle.

Boothby has concluded, after a great number of basal metabolism determinations made in women with and without thyroid disturbances, that the average during the menstrual cycle and during the interval is of negligent significance.

After a study of the hyperactivity of other endocrine glands, Hoppe bases his treatment of hyperthyroidism with corpus lutum, on the theory that the condition is caused by a defective secretion of the interstitial sex glands; that the hormones of the interstitial sex glands have an inhibitory and regulatory action on the secretion of the thyroid; that, when the function of these interstitial sex glands is deficient, there is a lack of physiological inhibition of the thyroid, with an excessive secretion, and therefore, hyperthyroidism. In other words, hyperthyroidism and hypo-ovarianism are synonymous conditions.

These contentions are directly opposite, also, to the conditions in case 1, where the hyperthyroid symptoms and the abnormal basal metabolic rate continued until a hypo-ovarianism was induced by x-ray therapy. In accordance with the contention of Hoppe, a great number of clinicians have used corpus luteum in the treatment of hyperthyroid conditions. But, upon reviewing their reports, we find that their cases, while having symptoms of hyperthyroidism, had basal metabolic rates which were either within or only slightly without the normal range. Therefore, it must be inferred that these cases were really cases of hypo-ovarianism with symptoms similar to the hyperthyroid state.

In contrast to most of the above investigations and in accordance with these two histories, Soiland says that, in many of their cases of x-ray therapy of the thyroid gland, they have found it impossible to obtain a decrease in the basal metabolism without x-raying the ovaries also. In fact, this circumstance has occurred so frequently that, if they fail to obtain a reduction in the basal metabolic rate as soon as x-ray treatment is instituted, they almost routinely x-ray the ovaries at the same time.

In conclusion: Judging from the above observations, an inverse factor must contribute to the cause of some cases of hyperthyroidism. The results of treatment have not reached the one hundred per cent mark, as is evidenced by still existing controversy between the radiologist and the surgeon. Possibly more attention to the ovarian function will aid in raising this average of cures.

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ETIOLOGY, DIAGNOSIS AND TREATMENT OF URETERAL STONE*

HERMON C. BUMPUS, JR., M. D.,
Section on Urology
Mayo Clinic, Rochester, Minnesota.

Read before the Twelfth Annual Meeting of the Medical and Surgical Association of the Southwest, Tucson, Arizona, November 11 to 13, 1926.

The cause, prevention, diagnosis, and removal of urinary calculi have always interested the medical profession. Hippocrates suggested as an explanation of the formation of calculi, the ingestion of certain muddy waters, and emphasized the possibility of the accompanying inflammation being eitologic rather than the result of the stone. The accounts of the skill of the preanesthetic barber surgeons in cutting for stone in the bladdar comprise some of the most dramatic incidents of our early surgical history. Yet, not until 1882 was the first ureterolithotomy performed, by Bardenhauer, and not until 1888 was the technic of the operation developed and described, by Tuffier. In 1909, only 172 cases had been recorded in the literature. Following this, a great deal of experimental investigation has been undertaken in an endeavor to learn the cause of the formation of such stones. The problem, however, remains unsolved, although the investigation has revealed many interesting findings and refuted some long-cherished beliefs. Great advances have been made in the diagnosis of such cases by the use of the roentgen ray in conjunction with the ureteral catheter and the making of ureterograms.

Most calculi contain oxalates, urates, phosphates, and calcium in various proportions. The constant presence of a calculus, once it is formed, testifies to the almost

complete insolubility in urine of these chemical constituents. There is evidently some substance in urine that, under normal conditions, keeps these chemicals in solution, for, in twenty-four hours, an average of 0.78 grams of uric acid, 0.015 grams of oxalic acid, 2.5 grams of phosphoric acid, and 0.25 grams of calcium are eliminated. This property of urine to hold chemicals in solution in greater amounts than is possible in water, is ascribed by most physiologic chemists to protective colloids. It is conceivable that, through faulty metabolism or as a result of the excessive ingestion of such materials in the food, too large amounts of these chemicals might reach the kidneys for the protective colloids to hold in solution. This idea has led to the age-old teaching that hard water derived from lime soil has a tendency to cause the formation of stone. Keyser, in a recent investigation at the Mayo Clinic, administered massive doses of calcium oxalate, chlorid, lactate, and phosphate to laboratory animals, and necropsy showed negative results. He concluded that the giving of lime salts in massive doses does not cause visible increase in the crystalline content of rabbits' urine and that the increased ingestion of calcium salts will not lead to significant increase of calcium in the urine.

A geographic study based on the incidence of urinary lithiasis in various parts of the world, bears this out. Urinary calculi are common in certain lime-stone areas, but in countries such as Canton Province in China the incidence is even larger and limestone is not an abundant constituent of the soil.

If the foregoing findings are correct, then the time-honored practice of advising patients with urinary calculi to drink only distilled water is without foundation in either experimental or pharmacologic findings. If patients follow such advice, usually they do not drink enough water, as distilled water is not readily accessible. As a result, the urine is much more concentrated than if they were permitted to drink the water undistilled. The concentrated urine gives greater opportunity for the precipitation of the crystalline contents, thus favoring the formation of stone. If such precipitation is due to a deficiency of the colloid content of the urine, it seems reasonable to suppose that bacterial infection might be the cause of the deficiency. Certainly the frequent presence of such infection in association with lithiasis can be interpreted as the cause rather than the result of stone formation, as has been shown experimentally by Rosenow and Meisser. They devitalized a dog's tooth, injected the root canal with organisms that were obtained from the tooth of a patient with renal lithiasis, and these organisms, when injected into rabbits, showed a specific localizing tendency for the kidney. Obviously, however, following single or even multiple intravenous injections, a chronic focus was not produced and calculus formation could hardly be expected. But by filling the root canals of the devitalized teeth with bacteria such a chronic focus was produced and, in the course of several weeks, roentgen rays revealed shadows in areas of the dog's kidney where formerly there had been none. At necropsy multiple renal stones were found.

Many observers have believed that anatomic changes are responsible for the formation of stone. Hunner believes that ureteral stricture is the primary cause and that the stone, so frequently found above the stricture, is a secondary occurrence. Bugbee has called attention to the frequency of renal stone in association with renal ptosis; and all are familiar with the frequency of stone in conjunction with prostatic hypertrophy. There can be no doubt that urinary stasis furnishes favorable environment for the occurrence of stone; but other factors are necessary. In the case of ureteral stone, the history of the colic produced by its migration from the renal pelvis to a point of lodgment in the ureter, would seem ample proof of its extra-ureteral origin, the stricture being due usually to ulceration and inflammation incident to the lodgment of the stone in the ureter.

Braasch, in reviewing the cases observed at the Mayo Clinic, pointed out that recurrence took place in less than 10 per cent of cases after removal of the stone at operation, when fluoroscopy or later reray had failed to reveal the overlooked fragments. Braasch and Carman adapted the bedside roentgen-ray unit developed during the war, for use in the operating room. With this procedure the surgeon is aided in finding small calculi, and when the operation is completed, but before the kidney is returned to its fossa, a fluoroscopic examination shows whether or not fragments are left that might serve as foci for the formation of new stone.

The fact that stones rarely develop in the remaining kidney following their removal from the other, Braasch believes is an indication that patients go through a stone-forming cycle which may last for several years. The condition seems to be due to an infection that upsets, for the time, protective colloid mechanisms. For this rea-

son it seems important to emphasize the desirability of removing all possible foci for renal infection. The invariable presence of such foci in these cases adds weight to the theory of their etiologic role. Yet, if the theory is in error, no criticism can be attached to the removal of an abscessed tooth or a tonsil containing pus, since both, in themselves, are a menace to health.

As knowledge of the cause of stone has progressed, so has that of diagnosis and treatment. The advent of the Bucky diaphragm in roentgen-ray technic made it possible to detect accurately even the most insignificant shadows, and ureterography makes their localization simple. Formerly we depended on the wax-tipped and lead catheter to aid in doubtful cases, but we now rarely employ either. The wax tip frequently may not be scratched, and the lead catheter may appear to lie in apposition to the suspected shadow on a two-dimension plate when in reality it is several centimeters anterior, or it may appear several centimeters away from the shadow of the stone and thus seem to exclude it when, in a greatly dilated ureter, it is on the opposite wall from the stone. With the injection of an opaque medium, preferably 12 per cent sodium iodid, the inclusion of the shadow within the ureteral outline makes its intraureteral position almost certain, while a dilated ureter at the stone or above leaves no doubt. Occasionally the stone will not permit the passage of the medium, in which case the ureter is outlined only as far as the stone.

The diagnosis having been made, the method of removing the stone becomes pertinent. Formerly ureteral stones were invariably removed by operation, and if the stone is greater than 1 cm. in diameter this is still the method of choice, as it is if stones are known to have remained at one point in the ureter for a long time so that they have become imbedded in the wall.

If the patient gives a history of recent colic and there is evidence of recent migration, manipulation cystoscopically will usually be successful. In the case of stones that have descended close to or into the wall of the bladder, manipulation is probably the procedure of choice. The removal of a small calculus deep in the bony pelvis under the bladder, offers extreme difficulties in the surgical technic, and better results are obtained by manipulation. Crowell reports removing eighty-eight stones in a series of ninety-eight cases, and Bugbee in a series of 347 used the bladder route successfully in 326.

The technical methods employed in the removal of stones by manipulation, vary with the operator. Lewis is pioneer in this field of surgery, and his ingeniously devised ureteral dilator is still employed by many urologists. For some years chemicals were thought to be of considerable aid and various antispasmodics, especially papaverin, were popular. Today urologists seem to agree that the two essentials to success are dilatation of the ureter and shifting of the axis of the stone.

The first essential can be accomplished by the use of a dilator, or by passing increasingly large catheters or sounds up the ureter past the stone, or by passing several catheters at the same time. It often happens that the narrowing of the ureter in the wall of the bladder and its resistance to dilatation not only prevents the passage of stones, but offers the greatest barrier to their removal cystoscopically. Frequently a ureteral orifice will hardly permit of the passage of a No. 4 catheter, and most painstaking dilatation will not enlarge it beyond a No. 10 or No. 12.

Since the chance of successfully removing the stone depends principally on the number of catheters that can be passed around it, inability to enlarge the orifice may result in failure to remove the stone. To overcome this difficulty I designed a pair of small rigid scissors that could be attached to a filiform for the purpose of cutting the ureteral meatus. The filiform is passed up the ureter as a catheter would be, and the scissors are then attached and guided by the filiform into the ureter to the desired distance. They are then opened and the upper blade, being double edged, cuts the upper wall of the ureter as they are withdrawn. If further cutting is necessary it may be done by the scissor action. By this method the ureteral orifice is made sufficiently large to admit readily from four to six No. 5 ureteral catheters; these are then passed by the stone and on the removal of the cystoscope are each twisted individually and then en masse so that the stone, becoming enmeshed in them, is usually withdrawn at the first attempt. If this fails, the procedure is repeated until it is successful. My only failures have been when it was impossible to pass the filiform by the stone. After removal of the stone, two catheters are left in the ureter to insure adequate drainage in case the trauma incident to the stone's removal should result in ureteral obstruction. If manipulation is not successful, one should be prepared to institute operative proceedings for removal of the stone at any time, since, if trauma has occurred, periureteritis with

complete obstruction of the ureter and ascending infection, may result. It is desirable to follow an expectant course of treatment in the hope that the stone will pass as a result of the manipulation, and if there is urinary drainage, this may be done safely. However, if complete obstruction has occurred, watchful waiting may prove disastrous and it should always be remembered that the mortality from ureterolithotomy is almost nil. In a series of 640 cases at the Mayo Clinic, reported by Scholl and Bumpus, there were but four operative deaths (0.62 per cent). There were no deaths following uncomplicated ureterolithotomy. In the four cases in which death occurred either other surgical procedures, such as appendectomy, were also carried out or other diseases of the urinary tract were partly responsible.

If ureteral lithotomy is not performed, ascending infection and ureteral obstruction rapidly result in sepsis of the kidney, so graphically described by Beer. With such a complication, immediate nephrectomy is obligatory and, if it is not performed, the retained toxic products of urinary retention and bacterial action produce such extreme toxemia as rapidly to impair the function of the remaining kidney, and, if treatment is not instituted, will result in complete anuria and death.

Formerly it was our custom to allow the multiple catheters to remain in the ureter forty-eight hours and, on their withdrawal, await the passage of the stone which might occur at the next voiding or during the following ten days. This necessitated constant vigilance on the part of the patient and nurses to see that the stone was not overlooked in the voided urine. Frequently it was believed to be lost at the time of defecation, and further roentgenograms would be required to prove this. In such cases the successful removal of the stone became a matter of debate and conjecture. To overcome these annoyances and to be able to show the patient the stone at the time of cutting the ureterial orifice, I have, in the last series of cases, removed the catheters immediately after their insertion and the manipulation, and have repeated the procedure until the stone was delivered.

The healing of the ureteral orifice in the cases I have examined subsequently, usually resulted in a somewhat larger ureteral meatus, but one that functioned in preventing regurgitation. This was also Braasch's finding in a series of experiments on dogs some years ago. In one case in which the patient recently returned to the Clinic this was not true and regurgitation occurred with a clinical manifestation of slight pain in the side during micturition. The stone in this case had been present for many months prior to its removal, and the unfortunate final results may have been influenced by the ureteral dilatation produced by the long period of partial obstruction.

Bleeding, if excessive, can be controlled by fulguration of the bleeding points, but this is seldom necessary, as there are no large vessels in this situation.

THE X-RAY SHADOWS OF SECONDARY INFECTION IN LUNG TUBERCULOSIS

By HARLAN P. MILLS, M. D., and W. WARNER WATKINS, M. D.

Pathological Laboratory, Phoenix, Arizona.

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On account of the physical conditions in the lungs, their radiologic densities are susceptible of finer analysis than are those of any other part of the body. Further, nothing in this field is of more interest and value than the differentiation, whenever possible, of lesions caused by tuberculosis from those produced by other infections.

It is well recognized that there are no pathognomonic physical signs of lung tuberculosis; however, radiologists believe that their particular contribution to the physical examination of the chest, when skilfully interpreted, will more accurately indicate the nature of a lesion, as well as its location and extent, than will any other part of that examination. Since the criteria which the clinician accepts in physical findings as suggesting tuberculosis and those which point the radiologist to this conclusion are based on the same fundamental anatomy and pathology, there should be no antagonism. The radiologist must always remember that his contribution to the physical examination is supplementary, even on those occasions when the supplement, like a woman's postscript, furnishes the real meat of the examination.

The fundamental investigations of Miller and Dunham, many years ago, regarding the architectural structure of the lung, the method of invasion by tubercle bacilli and the pathology produced, pointed the way to our subsequent observations that tuberculous infection and infection by other bacterial invaders produce different kinds of shadows in the lung field. If we will base our interpretations upon the fundamental investigations of Miller and Dunham, to which there have been no material additions, we will be in position to differentiate

etiological factors with a reasonable degree of certainty. It is our belief that wherever we have departed from the fundamentals mentioned and interpreted shadows as tuberculosis, without proper regard for the underlying pathology which must produce such densities, we have been out on the thin ice of conjecture and have too often been wrong in our conclusions.

We know that tuberculosis invades lung tissue through the lymph channels; therefore, that the infection first surrounds the lobules, because the lymphatic vessels enclose each anatomical lung unit very much as a fish-net holds its contents. The smallest visible tuberculous lesion, therefore, is the dim outline of a secondary lobule, with its congested lymphatics and beginning granulomatous consolidation. Such a lesion is essentially parenchymatous, and, since the lung parenchyma fills all the space between the hilus and the pleura, the tuberculous density may occur anywhere in this lung field. The lesion has a definite relation to the bronchial tree, and this relation can be traced by the striation densities which mark the blood vessels accompanying the bronchi. In instantaneous films, with the very finest detail, we can make out the extremely delicate net-like shadows surrounding the involved lobule within which is an area of increased radiopacity. On the usual film, there is only a blurring or haziness, more or less sharply delimited from the surrounding tissue, being roughly triangular at the lung periphery, though with varying shapes when located more deeply within the lung. Usually, when a patient comes for radiography, the tuberculosis is extensive; however, if not complicated by mixed infection, even a conglomerate shadow will show a simple multiplication of the characteristic lobular density. The loss of this type of shadow, or the obscuring of it by atypical densities with bizarre formation, is, in itself, good evidence of a complicating secondary infection.

In addition to its definite character, the tuberculous density is, for all practical purposes, an upper lobe shadow. Without discussing the reasons for this, it is a fairly safe rule that tuberculosis does not invade the basal regions until the local or general resistance has been lowered by some accompanying infection.

Therefore, in differentiating lung shadows, with reference to their etiology, we have two fairly safe guides; one is its location of the density; the other is its structural peculiarity. Pyogenic infections of the lung are mucogenous, as a rule, and invade along the bronchial mucosa, spreading from within the structural units, so that, when developed to the stage of visibility, they are relatively more radiopaque than are tuberculous shadows. Of course, after a consolidation is well established, the shadow will be the same whether the invasion is from the periphery through the lymphatics or from the center, as in pyogenic infections. However, it is very seldom that we find isolated tuberculous consolidations, without adjoining lesions presenting the typical characteristics of early tuberculosis. Tuberculous consolidations, when uncomplicated, usually spread by continuity and coalesce, while those of other infections are more likely to be discrete, even when quite numerous. Miliary tuberculosis, of course, is an exception.

When pyogenic or influenzal infections occur in the tuberculous lung, their shadows do not differ materially from similar densities in the non-tuberculous lung. In the hitherto normal lung, such infections are prone to involve the basal or hilus regions, so that accentuation of the hilus densities, or discrete densities in the hilus region, or discrete or irregular densities in the base, should be interpreted as probably non-tuberculous. When the same type of shadow occurs in a non-tuberculous lung, they should again be interpreted as probably non-tuberculous. If we have a cavity in the upper lobe of one lung and it becomes secondarily infected, we will soon find, in the parenchymatous tissue surrounding this cavity, shadows which, if found elsewhere in the lung, we should undoubtedly regard as the densities of non-tuberculous lesions. It is just as reasonable to interpret them as lesions produced by secondary invaders of the cavity as it is to regard them as tuberculous densities. In many cases an analytical interpretation is not possible, because a tuberculous caseating area soon becomes secondarily infected, and areas of secondary infection frequently become tuberculous, so that the shadows become so interwoven that the best we can say is that the method of extension and possibly the character of isolated densities suggest the influence of secondary infection complicating the tuerculosis.

Many of these densities which we attribute to non-tuberculous infection resolve and disappear. It may be said here that the only controversial point in this paper is whether a true tuberculous lesion, after developing to the stage of visibility on the x-ray film, will entirely resolve, leaving no trace of its shadow. It is our belief that

a tuberculous area, or any other granuloma, will not entirely heal by resolution, but there will always be some degree of cicatrization with resulting fibrous tissue visible on the radiograph; and conversely, that densities which do entirely resolve and disappear were not granulomata, but were simpler and less organized consolidations. We do not think that Gardner's report of the resolution of tuberculous lesions in experimental animals covers the point, so far as the radiopaque densities in human lung tuberculosis are concerned. The toxic reaction which occurs around all recent tuberculous foci and which is shown on the x-ray film as a nebulous density extending beyond the central area of greater opacity, will subside and the tuberculous shadow become correspondingly smaller, but there will always be some trace of it, if the cellular components of the granuloma are once organized.

In studying lung densities, we regard as presumptively non-tuberculous, the following:

(1) Any abnormal shadows confined to the basal region alone, whether due to an accentuation of the bronchial tree ramifications, or whether they are entirely isolated; whether discrete or conglomerate; whether recent or old, unless they present the typical characteristics of tuberculous infection which we do not recall ever having seen in the lung base. We realize that this interpretation will occasionally be in error, but not very often.

(2) Markedly accentuated hilus densities, or isolated densities near the hilus but lying apart from it. In the adult, the source of error here is not great, if we take care to differentiate the old linear striation and beading of healed tuberculosis from recently formed densities. In the infant and child, however, it is practically impossible to differentiate the shadows of hilus tuberculosis, slowly spreading along the main lymph channels, from the shadows of a low-grade bronchopneumonia such as we find following whooping-cough or measles. The chief differential point in such cases is the observation of resolution and disappearance of well established densities, which we regard as establishing their non-tuberculous nature for all practical purposes.

(3) Discrete, rounded or irregular densities lying apart from the shadows of an evidently tuberculous area and without any visible relation to the bronchial tree involved in the manifest tuberculosis. Here the chances of error, of course, are great and the conclusions, as previously stated, should be only general, as it may be impossible to pick out any given shadow as the density of secondary infection. However, the general character of the density and the method of extension are often very suggestive.

The practical value of differentiating, whenever possible, the shadows of tuberculosis from those of a complicating infection, should be obvious. For example, a rapidly advancing unilateral lesion, if tuberculous, probably would require different management from one which is due to a secondary infection. Or a mixed infection spreading out from a lung cavity, or an abscess distributing pyogenic infection through a tuberculous lung, require different treatment from that demanded by a pure tuberculosis.

Aside from these factors of practical value to the clinician, it is expected of the radiologist that he will go as far as possible in the study and interpretation of types of pathology examined by him, and nowhere in the body can this analysis of pathology be carried so far as in the study of lung shadows.

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LOCALIZATION OF BACTERIA IN THE LUNG APICES

(Review of Literature)

ORVILLE HARRY BROWN, M. D.,
Phoenix, Arizona

The question of the localization of bacteria—especially the tubercle bacilli—in the lungs, is one that has long interested me. I believe that upon the understanding of this question depends very largely the solution of the tuberculosis problem.

The premise of Dr. W. W. Watkins'[1] paper, that disease in the apices is likely to be tuberculous whereas that in the bases is probably non-tuberculous, is eminently correct as the vast amount of literature on the subject bespeaks. Primary tuberculosis of the bases of the lungs does occur, however, and should be kept in mind as a possibility. Likewise, apical infection may be the result of other bacteria than the tubercle bacilli.

Laennec,[2] the father of auscultation, wrote:

I would, therefore, beg to call the attention of the

practitioner to the successive development of the tubercles in the different parts of the lungs. They begin to show themselves, in the first place, almost always in the top of the upper lobes, more particularly in the right; and it is in these points, especially in the last mentioned, that we most commonly meet with the tuberculous excavations of vast size. It is by no means uncommon to meet with cavities of this kind, in the situation just named, when the rest of the lungs are quite sound and do not contain a single tubercle; but, in this class of cases, the patient, during life, has frequently exhibited no signs of pthisis, or only equivocal ones, and has died of some other disease. It is much more common, however, to find one single excavation and several crude tubercles, in a pretty advanced state, in the summit of the lungs; and the remainder of these organs, although still crepitous, and in other respects sound, crowded with innumerable tubercles of the miliary kind, extremely small, semi-transparent, and hardly any of them with yellow specks in the center. It is evident that these miliary tubercles are productions of a much later date than those which had given rise to excavation. As well from the result of my dissections as from observations of the sick, I am well assured that this secondary crop of tubercles appears about the time when the first set begins to be softened. Very commonly we observe in the same lung evident marks of two or three successive eruptions of tubercles. Almost always, in these cases, we find that the most ancient of those which occupy the summit of the lung, have already reached the stage of excavation; the second crop, situated around and rather below these, has already become yellow, or at least, the greater part of them, but still of no great size; that the third eruption composed of crude miliary tubercles, with some yellow points in their centre, is situated still lower; and, finally, that the bases and inferior edge of the lung exhibit the most recent formation of all, consisting of miliary tubercles quite transparent. Exceptions to the order of development just described are by no means common. It is extremely rare for excavations to be first developed in the middle or base of the lungs; it is excessively rare to find the first eruption so numerous as to prove fatal.

H. R. M. Landis[3] makes the dogmatic statement that the limitation of the physical signs to the bases of the lungs excludes tuberculosis of the lungs, but that lower-lobe involvement may follow apical infection.

William Stokes[4] said that, if the signs of disease of the lungs are generally and equally distributed throughout the lungs, the existence of tubercles in those lungs is improbable.

P. Kidd[5] states that other investigators found basal tuberculosis far less common than primary apical; he had two cases of primary basal tuberculosis in 412 autopsies of tuberculous individuals.

J. K. Fowler[6] believed that the apices of the lower lobes were susceptible to tuberculous infection next in turn to the lung apices.

F. H. McCrudden[7] says tuberculosis is to be differentiated from post-influenzal chronic pneumonitis by the absence of localization in the upper lobes in the influenza condition. He found a chronic pneumonitis following influenza, which endured for four years; the lungs had diffuse involvement which was demonstrated by both physical examination and roentgen picture.

G. Toppich[8] calls attention to non-tuberculous apical broncho-pneumonias.

O. H. Stansfield[9] reports the study of the lung findings in twelve cases of influenza; the involvement was most commonly in the right lower lobe, but might be anywhere throughout the lungs.

B. P. Stivelman and H. Hennell[10] report two cases of chronic pulmonary miliary tuberculosis in which the tubercles were demonstrated to be profusely distributed throughout the lungs.

E. L. Opie[11] says that the tuberculosis of infancy resembles very closely the experimental tuberculosis of animals; the chronic tuberculosis of the adult differs from the tuberculosis of children and from the experimental tuberculosis of animals.

William S. Middleton[12] reports four cases of definite pulmonary tuberculosis with the findings entirely basal in three of the cases; the fourth case had a very slight infiltration of the apices. He says that these cases are exceptions to the rule and that discussions of the improbability of tuberculosis in the presence of demonstrable signs in the bases alone, are futile in the face of a characteristic clinical picture. The greatest care must, therefore, be exercised to eliminate a tuberculous etiology in basal as well as apical lesions.

From the preceding citations from the literature, it is evident that tuberculosis is far more common in the apices than in the bases of the adult lung. Other pulmonary infection, especially the acute, is likely to be diffuse, or, if localized, more in the bases than the apices. In children, however, tuberculous infection does not have a tendency to localize in the lung apices.

There have been numerous explanations offered as to why tubercle bacilli locate most commonly in the apices of the adult lung. In an article published in 1923, I[13] reviewed the literature on the subject of apical tuberculosis and presented my own explanation of adult apical tuberculosis.

I now propose to review my own ideas, tersely, and to present the data now available on the subject.

My own idea has been that there is one factor in the adult which does not exist in the child, and which is the great factor in producing apical tuberculosis. I refer to the insult which the cervical and mediastinal and bronchial nodes of the adult have suffered because of the years of assault from bacteria and toxins which come by way of the cervical lymphatics. My conception is that lymph nodes are, in a sense, filters through which lymph, with its burden of waste, passes, and as time progresses they must suffer a diminution of function.

Chronic inflammation of any part causes, therein, swelling and a production of fibrous tissue; fibrous tissue tends to contract; in this way the nodes must become more or less obstructed. Time is the one factor to change the youth to an adult and the easily permeable lymph node to an obstructed node.

My assumption, further, is that the deep cervical lymphatics drain into and through the mediastinal nodes and that the mediastinal nodes anastamose with the bronchial nodes; the topmost bronchial nodes. those through which the lymph from the

lung apices filters, are the ones to suffer the greatest amount of damage. There may be exceptionally free anastamosis between the mediastinal and the upper bronchial nodes. Bacteria which pass the mediastinal and bronchial nodes, as well as bacteria which enter the body at any point and survive long enough, go into the blood stream and, thence, through the lungs, where they are prone to be taken up by the pulmonary tissue to be passed on to the bronchial nodes. In the event that the lymph stream of the lung apices is sufficiently slowed, some of the bacteria may stick in the lymph vessels of the apex and cause a lesion there. It seems possible, too, that bacteria from a lymph node might grow in the stagnant lymph of an obstructed vessel, and thus the parenchyma of the lung becomes involved by retrograde invasion of bacteria. The bacteria which find the proper oxygen tension and other suitable soil conditions will be the ones to proliferate where they stick. When the lymph stream becomes stagnant, an acid condition develops, and the amount of oxygen present is lessened. The tubercle bacilli must have just this sort of culture conditions. It is also true that other, for the most part slow-growing, organisms desire similar growing conditions and hence, the other bacteria growing faster than the tubercle bacilli may help to prepare the soil of the apices for the tubercle bacilli.

Another important point is that large numbers of bacteria getting into the body and reaching any particular spot may break down the resistance that would otherwise be impregnable. The tubercle bacilli may reach the apices of the lung in great numbers by way of the cervical mediastinal and bronchial nodes more commonly than by any other route.

The portals by which bacteria enter the body, it is fairly conclusively decided, are, in the main, the mouth and the nose. They may enter with the air, the food, the drink, the fingers, or in some other way. With the air they likely come in contact with the mucous membrane of the upper respiratory tract from where they may follow a course similar to that of bacteria entering in other ways than with the air. Those bacteria which get into the trachea and bronchi may yet come in contact with the mucous membrane and be carried by the cilia to the pharynx.

The residual air of the lungs is an important factor in causing bacteria to get entangled with the mucous membrane of the lower respiratory tract. Those which reach the bronchioles and beyond may be passed, through the aid of phagocytes or otherwise, to the pulmonary lymphatics. If the bacteria reach the lymphatics in great numbers, especially at a place where the lymph circulation is stagnant and the growing conditions are suitable, a growth of the bacteria at that point is likely to result.

The bacteria which enter with food or drink, or in any other way, may be swallowed. They may pass the stomach, and find, perchance, a growing place in the alimentary tract, from which they go to the lymphatics, through the nodes to the blood stream and thence to the lungs to suffer a fate similar to that of bacteria reaching the lungs by way of the pulmonary artery blood stream.

Bacteria which find lodgment and favorable growing conditions about the mouth or nose, may proliferate to tremendous numbers; from them, quantities of bacteria pass by way of the cervical lymphatics and mediastinal nodes to the bronchial nodes, and on to the blood stream. Many of the bacteria linger long enough to damage the nodes. After reaching the blood stream they are at once returned to the lungs and to the bronchial nodes.

An important part of my explanation of bacterial localization is a favorable growing place near the portal of entrance to the body and then a more or less direct transmission of those bacteria to another place —the tracheo-bronchial nodes—suitable for their growth.

A survey of the literature shows that there has been a great deal of attention given recently to the question of the localization of bacteria in the lungs. The older literature has a considerable number of references on the question but, in the main, the problem was attacked from the standpoint of anatomical construction of the lungs and of the upper part of the chest. The general idea was that the constriction of the apices by the first rib, the relatively little movement and the dwarfed tortuous bronchial branches, produced a markedly slowed lymph circulation of the apices and, hence, offered bacteria a good chance to stick in the apical lymphatics. These explanations fit in with my theories.

Freund[14] had the theory that the short and often ossified first costal cartilage caused the first rib to press unduly upon the apices.

A Wolff-Eisner[15] reports 156 cases of calcified first rib. His conclusion is that there is no relationship between apical tuberculosis and a calcified first rib.

Birch-Hirshfield[16] believed the stunted angular upper bronchi to be the chief factor in predisposing the tops of the lungs to tuberculous infection.

Schmorl[17] thought the short fixed rib caused a

furrow across the upper lobes which gave the bronchi thereof their peculiar anatomical construction and that this reduced the vitality of the apices. Hart nd Harass[18] said the sternal end of the first rib being lower than the vertebra end causes compression of the apices; the shape of the verebrae of the region may also be such as to infringe upon the apices; these factors interfere with ventilation and embarrass the blood and lymph flow. Bacmeister,[19] Rothchild,[20] Martins,[21] Tendloo,[22] Keith,[23] Stiller,[24] Schiele,[25] and Pottenger,[26] are others who take the view that apical tuberculosis is caused indirectly by the peculiar shape of the upper aperture of the thorax. Pottenger adds that the lung of the child grows far out of proportion to the growth of the chest; especially is this true of the upper thorax where a relative flattening is taking place by virtue of the falling of the sternal ends of the upper ribs. This, he thinks, causes a squeezing of the lung tissue of the adult apices and serious interference with respiratory movement and the blood and lymph flow thereof. Fischberg[27] accepts all the argument in favor of slowed lymph and blood flow of the apices and deems it important but thinks there must be some other factors to explain the apical localization. Phillips[28] thinks the orthograde posture causes a relative anemia of the pulmonary apices and a consequent reduced immunity to tuberculosis.

C. T. Zeitschel[29] reports two cases of muscular atrophy and paralysis of shoulders. In both cases there was compression of the lung apices and a resultant lack of aeration; he thinks compression produced diminution of the lymph flow and, hence, a predisposition to apical tuberculosis.

J. Peiser[30] reports thirty children with primary foci of tuberculosis in the apices of the lungs. A large percentage of these children had narrow chests and, to the author, this was important in the cause of the lesions.

Joseph Walsh[31] says, while it is extremely difficult for particles of foreign matter in the inspired air to reach the respiratory parenchyma, the possibility of the dust and bacteria reaching the apical alveolar tissue is greater than its getting elsewhere in the lungs on account of the naturally greater pressure or velocity of air upward, due to the greater suction of the more active alveoli, the straightness of the paravertebral bronchus and the failure of the heart beat interference in the upper lobe. The right lobe is larger than the left and the right bronchus is higher and larger and this gives the right upper lobe greater suction than the left upper; the right apex is the first to be inflated with inspiration and the last to be deflated in expiration. He is of the opinion that the explanation of the predilection of tuberculosis for the apices is that the lung parenchyma of the apices has greater functional activity than any other portion of the lungs. His opinion is based upon facts as: "the therapeutic action of rest, on the increasing development in size and number of hematogenous miliary tubercles from the base upward, the enlargement of the alveoli in emphysema and in normal lungs, with age, in the same direction, and on the fact that, while the inferior border of the lung fails to descend as low as nature would allow it, the apex is pushing upward through tissues designed to hold it."

H. Beitzke[32] writing upon "Tendency of Apices to Chronic Tuberculous Infection," says the primary cause is the better aeration of the apices as compared with the bases. Another factor which may be operative is a local allergy of the apices. It is not a matter of distribution of bacteria for they are probably equally distributed to all parts of the lungs.

Von Zwalenberg and Grabfield[33] opined that tuberculous infection goes direct from the cervical lymphatics to the pleura of the apices. Grober[34] injected india ink into the pharyngeal tissues and found the ink in the apical pleura.

Beitzke[35] and Most[36] say there can be no lymphatic connection between the cervical lymph nodes and the pleura of the apices.

D. Reinders[37] advances the conception that apical tuberculosis results from cervical lymphadenitis conveyed to the apex by adhesions, and says that good treatment of teeth, tonsils, and other mouth foci will help to prevent apical tuberculosis.

Shaw[38] found that, in a rabbit with one collapsed lung, tubercle bacilli, on being introduced into the blood, located invariably in the collapsed lung. This appears logical as the lymph spaces in a collapsed lung must become considerably narrowed.

Beitzke[39] believed that there is no connection between the cervical lymphatics and the bronchial nodes. Middleton[40] says uncritical are the writers who have attempted to show a relationship between cervical lymph-node infection and apical tuberculosis. It is his contention that there are no direct lymph or blood connections between the lymph nodes of the neck and the lung apices and, hence, there can be no connection between infection in the cervical nodes and in the lung apices.

J. Koch and W. Baumgarten[41] believe that pulmonary involvement of tuberculosis occurs from a primary infection of the mouth and nose but that it comes about because the bacilli are carried by the lymphatics to the blood stream and then to the lungs; they assert that there is no connection between the deep cervical lymphatics and the tracheo-bronchial nodes.

Gary[42] and Gerrish[43] books on anatomies say that the deep cervical lymphatics communicate with the mediastinal nodes and these in turn with tracheo-bronchial nodes.

Pfeiffer,[44] Grober,[45] Klebs,[46] Beckmann,[47] Wassermann,[48] Aufrecht,[49] Gordeler,[50] Grawitz,[51] Behring,[52] Thompson,[53] Pottenger,[54] Hildebrandt,[55] Buttersack,[56] and Weismeyer[57] believed that tubercle bacilli pass from the cervical lymphatics to the bronchial nodes. Most[58] has demonstrated, in man that there is a connection between the deep cervical lymphatics and the tracheo-bronchial nodes.

Rogers[59] has found that guinea pigs inhaling a spray of tuberculous sputum develop tubercles in the cervical mediastinal and tracheo-bronchial lymph nodes.

Allen K. Krause[60] says that tonsil tuberculosis is carried first to the deep cervical lymph nodes and thence to the mediastinal and tracheo-bronchial nodes.

S. L. Cummins[61] says that Calmette and Uhl[62] in 1913 succeeded in producing cervical adenitis and, in turn, tracheo-bronchial adenitis by infecting guinea pigs in the conjunctivae.

M. Ikeda,[63] in a study of 661 patients, found the incidence of cervical node tuberculosis was greatest during ages from 15 to 30 and especially great at 20 to 22 years; the incidence of pulmonary involvement almost agreed with these figures.

L. B. Crow[64] reports that in 4.000 cases of manifest pulmonary tuberculosis he found that they all had enlarged hila and mediastinal lymph node enlargement; he says that in the cases where the infiltration is fairly heavy, a distinct chain of nodes extends from the upper portion of the space direct to the hilum region and, when the infiltration is slight, the narrow lines are seen like a strand of rope extending from the upper mediastinum to the hila.

In one of E. L. Opie's[65] autopsies, three small lesions were found at the right apex and the nodes at the bifurcation of the trachea were diseased. The left lung and its highest nodes were free of disease. This is more or less typical for all of his autopsy records.

He found in an autopsy on a colored woman with pulmonary tuberculosis, apical tuberculosis with cavity formation and tuberculosis of the peribronchial, peritracheal, and mediastinal lymph nodes.

J. Mendel[46] inoculated bovine tuberculosis into the milk teeth of two young monkeys and sealed up the cavities; local abscesses soon developed; the animals died of pulmonary tuberculosis and without macroscopic lymph node involvement.

H. J. Corper[47] found that a nasal instillation of a fluid suspension of human tubercle bacilli into dogs, during anesthesia, produced cavitation in the upper portion of the lungs of a dog.

W. Baumgarten[48] found that rabbits and guinea pigs infected by oral or conjunctival routes developed cervical adenitis and a secondary pulmonary tuberculosis.

Allen K. Krause[49] found that guinea pigs which had been infected, no matter at what point, with a non-virulent strain of tubercle bacilli, isolated in 1890 by Trudeau, exhibited gross tubercles of the tracheo-bronchial lymph nodes. In rabbits he says there is more probability of bacteria staying in the lungs, as the rabbits' lungs have a great amount of lymph tissue; bacteria enter the lungs in clumps and in large numbers; the lung lymphatics become congested with bacteria and incapable of carrying them to the nodes and, hence, many remain and set up lesions in the lung parenchyma.

Krause again writes that tuberculosis infection is more prominent in the tracheo-bronchial lymph nodes than in the pulmonary tissue. In rabbits, tuberculosis infection begins in the lymphatic channels of the pulmonary tissue about the bronchi, most commonly. Krause reasons that lymphatic channels which drain readily, pass the foreign material on to the nodes; but, after a time, there is an increase of lymphoid tissue along the channels so that greater or less obstruction of the channels results. In this way is determined whether the bacilli find lodgement in a lymph channel of the lung parenchyma or near the hilum or within a node.

Henry Stuart Willis[50] found that, when tubercle bacilli are injected into the skin of a guinea pig, within 24 hours they pass through the lymphatic vessels to lymph nodes five centimeters distant from the site of injection; at the end of four days they may have made a complete circuit of the body and found their way to the iliac, the treacheo-bronchial lymph nodes and to the spleen and lungs.

A. Puppe[51] tied off the trachea and esophagus in rabbits and painted the mucous membrane of the mouth with tubercle bacilli. Within thirty-hours the bacilli had invaded the submental and sub-maxillary lymph nodes.

J. Koch and W. Baumgarten[52] placed a droplet containing eigth to ten thousand living virulent tubercle bacilli on the tongue or bucal mucosa of a guinea pig, without tuberculosis regularly resulting; but when they applied ten million of the same bacteria, positive infection consistently resulted; the cervical lymph nodes enlarged, sometimes greatly, and resembled scrofulous glands of children.

Warnecke[53] is of the opinion that frequent colds prepare the mucous membranes and the lymphatic system for invasion by the tubercle bacilli.

P. B. MacCready and S. J. Crowe,[54] in a study of 3260 patients in which tonsils and adenoids were removed, found fifty cases with tuberculosis of the nasal and pharyngeal lymphatic tissue; they comment on the marked frequency of cervical and mediastinal lymph node involvement in these cases and state that tuberculosis of the tonsils and adenoids is rarely recognizable from gross appearance.

W. V. Mullin,[55] in an examination of 400 pairs of tonsils found tubercle bacilli in seventeen of the pairs and states that there was no evidence, except obtained from the microscope, that any of these tissues was tuberculous.

Allen K. Krause[56] says: "Buccal and pharyngeal irritation or infection has, as is commonly observable, a peculiarly intimate effect on the cervical lymph nodes. And once we reflect that these nodes adjoin and drain the two major portals of entry of tubercle bacilli, that they are the most frequent site of clinical tuberculosis in children, that for every case of manifest disease, there are certainly several times as many infections and that tuberculosis infection within them is markedly affected by any disturbance of their normal function, we begin to realize how much healthy mouths and throats may mean in the prevention of tuberculosis."

I. E. Less,[57] writing on x-ray studies of tuberculosis in infancy, says lymph node changes are the rule and come in the following order: the peritracheal nodes, the perihylar, and the peribronchial. The shadow of the upper mediastinum is characterized by smooth contour, even density, and unilateral position. Until later developments, it is not possible to differentiate the types of bacterial invasion.

J. P. Garrahan[58] found apical tuberculosis in children and adenopathy of the tracheo-bronchial lymph nodes.

Helen Eliasberg and W. Neuland[59] have found a type of pneumonitis in children which lasts for weeks or months and clears up except for enlarged hilum lymph nodes.

A. G. Schurlock[60] reports an infant dying of pulmonary tuberculosis in which the lesion, as shown at autopsy, was located in the upper part of the lower left lobe and the hilum lymph nodes draining this area were enlarged.

Anton Ghon [61] is of the opnion that pulmonary infection in childhood is primary in the lung tissue and secondary in the regional lymph nodes.

H. Schade[62] believes that "colds" injure the lymph nodes of the pharnyx, trachea, and bronchi and open up the portals of entry for secondary infections.

Debre, Duhem and Petot[63] report non-tuberculous trachea-bronchial adenopthy shown by autopsy in two groups: the intertracheo-bronchial and the right antero-lateral-tracheal.

Wm. Snow Miller[64] believes that lymph nodes, and lymphatic tissue situated upon lymph vessels as they are, serve as centers for the gathering of germs and other matter conveyed there by phagocytes and play the part of filters interpolated in the lymph circulation. Miller is of the opinion that wherever tubercles are situated in a lung the site was one where there was lymphatic tissue. He found that there is a greater number of lymph nodes associated with the eparterial bronchus than with the bronchus which supplies the middle or lower lobe on the right side.

Sukennikow[65] found that the right upper lobe has more lymph nodes than have other lobes of the lung.

N. Neild[66] calls attention to the influence enlarged lymph nodes have, not only upon the lymph circulation, but upon the blood circulation as well. He comments upon the thin wall of the lymph vessel and the low pressure of the lymph stream.

V. Miulowski[67] comments on the frequency with which enlarged tracheo-bronchial lymph nodes are found in children.

J. Kottmaier[68] says enlarged bronchial lymph nodes have a serious retrograde effect upon the tissues of the lungs.

J. D. Lawson[69] presents a study of hilum nodes. He thinks enlarged hilum nodes are common even in youths. Associated therewith are often cough, recurrent colds, cervical adenitis, and changes in the corresponding lung. The changes in the lung seem to the author to be a cause rather than a result of the hilum adenopothy.

J. B. Hawes[90] in discussing hilum tuberculosis says concomitant findings are frequent coughs and colds, tonsillitis, adenoids and cervical adenopathy.

E. Bac[91] says that, while the tubercle bacilli are usually considered as aerobic in character, there are many facts which indicate that they really are only relatively so. He says that when cultures are made direct from serous effusions and tuberculous organs and the proper acidity maintained, the tubercle bacilli multiply, always beneath the surface and often at the bottom of the tubes; inoculations of the blood of tuberculous guinea pigs or of triturated tuberculous organs into the liquid culture media, give colonies upon the submerged clots or parts of organs. Growth in the pellicle comes later and seems to depend upon an adaptation of the bacilli to aerobic conditions. Development of the bacilli is not arrested by a covering of oil or vaselin, or by driving the air from the culture media by boiling previous to inoculation. These bacilli grown beneath the surface retain their acid fastness, and vitality and virulence remains longer in them than in those of the surface growth.

Louise G. Robinovitch and George W. Stiles, Jr.,[92] by a series of elaborate experiments, found an alkaline medium unfavorable and an acid medium favorable to the growth of tubercle bacilli.

J. Roux[93] calls attention to the fact that the blood and lymph are invariably acid in cases of tuberculosis.

SUMMARY

The evidence of the observations and experiments accumulated in the literature, indicates that the localization of the tuberculous infection in the apices of the adult lungs results from a combination of causes all tending toward an injury of the pulmonary lymphatics.

Bacteria may be inspired from the atmosphere into the alveoli of the lungs. From the lung parenchyma the bacteria pass to lymphatics of the lungs. If the organisms are of virulence and numbers enough to injure sufficiently the lymphatic tissues, they stick there and produce disease. In case the lymph structures in any areas of the lungs have previously been deteriorated by disease, the bacteria more readily gain a foothold there than elsewhere. Again, bacteria reaching any certain part of the lungs in greater concentration, or staying there with greater ease, than they do elsewhere in the lungs, would tend to set up disease in such a part of the lung. Walsh and Beitzke take the view that the short bronchi of the upper lobes and the lack of bony framework in the supra-clavicular portions, favor the ready passage of bacteria to the apices. The slow response of the supra-clavicular areas to expiration, holds the bacteria-laden air in these alveoli longer than they would be held elsewhere.

The longer and more tortuous the bronchi through which bacteria in air pass, the more the chance for the bacteria to become entangled in the bronchial cilia and be kept back from the alveoli. The bronchus is larger and less tortuous in the right upper lobe than in the left and this may account for the fact that tuberculous disease is more common in the right apex than in the left. The heart beat affects the lower portions of the lungs more than the apices and may be a factor hindering aspiration of particulate matter to the bases.

The compression of the first ribs upon the apices, as suggested by many writers, may cause under-inflation of many alveoli, and a consequent susceptibility to tuberculous infection. Shaw found a collapsed lung to be more susceptible to the blood stream bacteria than an inflated one. Collapsing of lung cells would certainly tend to narrow the lymphatics of the area, making them less pervious to bacteria.

Clumps of lymphatic cells on the lymph vessels serve as filters for the lymph; the larger the number of bacteria reaching these filters, the more likelihood of the vessels becoming clogged. If for any reason the lymph nodes draining the lymph of the apices are damaged, the lymph stream of these areas would be slowed and bacteria would likely stick in the lymph vessels of the pareichyma. Thus apical disease can become established.

The weight of the evidence is that anastamoses exist between the tracheo-bronchial and mediastinal nodes. Hence, bacteria and toxins from the cervical lymphatics have a chance to assail the bronchial nodes, the topmost nodes which drain the apices more than the lower ones.

The tonsils, adenoids, sinuses and abscessed teeth are excellent breeding places for bacteria. The cervical lymphatics and the topmost bronchial nodes are thus afforded excellent chances to gather immense quantities of bacteria. Some of these bacteria may well be tubercle bacilli as examination of the tonsils has conclusively shown.

The ordinary bacteria of the foci of the mouth and head may be of low virulence but a continual assault from them may prepare in the apical tissue an acid and slightly anaerobic soil which is so necessary for the slow growing tubercle bacilli.

Upon this course of reasoning we must give close attention to the foci of infection about the mouth and nose, especially, as a prophylactic measure against tuberculosis.

Enlarged hilum lymph nodes occurring in the adult more than in the child, and upper nodes being affected more than the lower, would seem to be the most important of

many factors in producing apical tuberculosis in adults.

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FOUR CASE REPORTS

(Presented at the Staff Conference of the El Paso Masonic Hospital, El Paso, Texas).

CASE 1. ENCEPHALITIS

DR. J. M. RICHMOND

Man, age 20, brought in by ambulance, semiconscious, with rapidly developing coma. Temperature of 103; pupils equal and normal in reaction to light; neck is still and patient complains when neck is manipulated; chest is negative; abdomen is tender all over, patient not allowing the abdomen to be touched without moving the surgeon's hands; abdominal muscles are rigid; genitals normal without evidence of venereal disease; skin shows no scars or rashes; bones and joints show no pathology; breathing is stertorous; Babinski's and Koenig's signs present and patellar reflexes gone.

Father states that for two or three weeks past patient has been irritable, nervous, and complaining of intense headache, and that on the day of onset of disease he had told them that he had had no bowel movement for a week. That evening he had a convulsion. He works in a store, eats cheese and knick-knacks between meals and complains of lack of appetite at meals. He is habitually constipated. His temperature had been up to 104 during this attack and prior to entrance to hospital he had been taking "fever medicine."

Family history negative for tuberculosis, cancer and chronic diseases of any kind.

Working diagnosis: Encephalitis.

Laboratory reports: Blood, Hbg. 90 to 100 per cent; white cells, 11,750, with 76 per cent polys. Widal negative. Urinalysis negative. Spinal fluid, pressure 45 reducing to 12 after withdrawal of 45 c.c. of fluid; the first 15 c.c. was clear and the last 15 c.c. slightly turbid; cell count on the first 15 c.c. was 150 and on the third 15 c.c. was 450; coagulation slight after one hour; the differential count showed 94 per cent small lymphocytes; Wassermann was negative; globulin positive; sugar increased.

The patient went into coma soon after entering hospital, continued to decline and expired on the fourth day.

Autopsy: On opening the cranial vault the dura was found somewhat congested, the vessels over the brain cortex showing marked congestion. The surface of the right temporal lobe was brown with numerous petechial hemorrhages beneath the pia. This condition extended for about 3 cm. over the lower surface of the right frontal lobe. The temporal lobe was very soft and the brain tissue about the consistency of thick pus. This softening did not extend to the ventricles. The base of the brain, including the surface of the cerebellum and pons were roughened, with plastic exudate. The meninges were held togther by this exudate. The exudate is not firm enough to cause complete blocking of the spinal fluid.

Anatomical diagnosis: Encephalitis acute, right temporal lobe; plastic meningitis about the brain base.

Conclusions: The early symptoms in this case indicate the fairly rapid development of localized encephalitis. This was borne out at autopsy by the right temporal lobe findings. The encepahlitis is of the hemorrhagic type which extends to the surface of the brain. The meningeal phase is obviously secondary to the encephalitis, and occurred after the brain infection reached the surface of the right temporal lobe.

CASE 2. CEREBRAL HEMORRHAGE

DR. E. J. CUMMINS

Blacksmith, 49 years old. On Nov. 28th, the patient, feeling apparently well, had dinner at noon, went to Juarez and drank one glass of beer. He was asked to take another when he remarked that he did not care for another, that he felt dizzy and had a terrific headache. He vomited, was brought home and put to bed and about 8 p. m. I saw him. He was complaining of headache, soreness in the neck and in the buttocks.

On examination he had some rigidity in the neck; his left eye turned out slightly, he was conscious and could talk. There was no hemiplegia; his pulse was 68; there was no odor about the breath; his reflexes at that time were normal; his blood pressure was 280-110. Blood urea showed 90 mgs. per 100 c.c.

Tentative diagnosis: Uremia.

Progress: On entrance into the hospital, patient was in a deep stupor; he would arise at intervals and go back into stupor. He still had a rigid neck, double Koenig, positve Babinski; exaggerated patellar reflex on the right side, negative Gordon and Oppenheim. Blood pressure was 280. Catheterized specimen of urine showed pus, blood and hyaline and granular casts. The patient was bled 36 ounces, his blood pressure dropping to 190. His stupor continued to grow deeper; Cheyne-Stokes respiration appeared and his temperature went to 106. The patient had convulsions every few minutes nearly all

day, respiration failed and the patient finally expired.

Partial Autopsy, Dr. Geo. Turner: The entire surface of the brain shows extreme congestion. Beneath the frontal and temporal lobes and extending around the pons are numerous free blood clots. The left frontal lobe is soft over its anterior portion. Sections through this area shows hemorrhage into the brain substance with destruction of the brain tissue for a diameter of 8 cm. The hemorrhage communicates with the left lateral ventricle filling the ventricles with free blood. There is no evidence of infection.

Diagnosis: Cerebral hemorrhage, left frontal lobe.

Conclusions: The motor area of the brain was relatively unaffected by the hemorrhage, even though it was very extensive, with large amount of brain tissue destroyed. The hemorrhage occurred so far toward the front of the cerebrum that motor nerve symptoms of apoplexy were not present. The patient was unconscious, from cerebrum destruction, but this, of course, is not pathognomonic.

CASE 3. CEREBRAL GUMMATA

DR. E. D. STRONG

The patient was brought into the hospital in a state of coma, having been picked up by strangers when he fell to the ground unconscious. He has not regained consciousness, and no past history obtainable.

Physical Findings: The patient is a man about sixty, in coma, pupils dilated; there is no rigidity of the neck; the breathing is stertorous. There are no rales in the chest; heart action is weak and the pulse is rapid. The abdomen is not rigid; tympanites is not present; the genitalia appear normal. There seems to be repression of urine. The skin is dry; cyanosis is present. There is no adenopathy.

Urinalysis: Specific gravity 1015, indican negative, small amount of blood, four plus albumen; moderate amount of mucus, occasional finely granular casts; negative for sugar; small amount of pus and small amount of epithelia. Blood Wassermann negative. Blood urea, 125 mgs. per 100 c.c.

Spinal Fluid: Appearance clear, cell count 3, globuline not increased, sugar not increased. Spinal Wassermann negative.

Autopsy, Dr. George Turner: The skull bone is rather thick and brittle; dura is firmly adherent to the skull bone; the valvarium has several rather deep erosions along the sagittal suture line; the dura is very thick and fibrous. On either side of the sagittal sinuses are patches of cauliflower-like gummatous growth wheih fit into the skull bone erosions. The entire cortex of the cerebrum is covered with grayish fibrosis in the arachnoid layer of the brain. There are small cortical hemorrhages, scattered here and there over the cerebrum; there is no blood outside the brain tissue and the ventricles contain no blood; there is a small hemorrhage in the substance of the right cerebellum; all hemorrhages, however, are superficial and very limited in extent.

Both pleural cavities present essentially the same picture, old fibrous adhesions firmly fix the lungs both posteriorly and laterally, adhesions about the right lung being more extensive than about the left; this lung is also fixed to the diaphragm. The pericardial cavity contains about 150 c.c. of serous fluid; pericardium is everywhere smooth, except over the anterior surface of the right ventricle there are patches of leukoplakia several centimeters in diameter; there is a rather thick layer of fat lying beneath the pericardium practically all over the heart; there are small areas of leukoplakia scattered over the heart surface.

Both lungs show the same pathology; anthrocosis is marked, but there is no evidence of pneumonia or tuberculosis.

Heart is considerably enlarged; the left ventricular wall is thickened and rather soft; there are no valve leaflet erosions; yellowish gray erosion is marked in the aorta and around the orifice of the coronary arteries; this arteritis also extends into the coronary arteries. Liver is light gray in color and the lower margin is distinctly rounded; it is contracted and the liver substance is very firm; the gall bladder contains no stones, though it is filled to distention and does not empty on compression. The stomach is rather high in the abdomen and shows no defects; the first portion of the duodenum is rather thick and fibrous though it showed no open lesion. Pancreas is rather firm. Spleen is about three times its normal size, very soft and friable; the lymphatics generally are enlarged. The small intestine and colon are negative except for chronic fibrous appendicitis. Left kidney is lobulated and the capsule peels easily. There are two cysts about 3 cm. in diameter occupying the anterior portion of the upper pole; there are smaller cysts scattered over the cortex; the kindney substance is congested, the glomeruli are prominent; the collecting tubules are filled with free blood. The right kidney presents the same picture except htat it has a cyst about 10 cm. in diameter occupying and growing out of the upper pole.

Anatomical diagnosis: Fibrous meningitis with gummata. Acute nephritis with cystic kidneys. Atrophic cirrhosis of the liver, chronic aortitis, and myocarditis.

Conclusions: The interesting feature of this case is the wide spread manifestations of syphilis with no chronic manifestations of its activity and with negative blood and spinal fluid findings before death. This was of course an old syphilitic condition, which must have been actively treated over a period of many years.

CASE 4. BRAIN ABSCESS

DR. J. A. RAWLINGS

The patient is a well developed male child of five years. His parents are living and well, and his family history is negative for chronic diseases.

The child complains of headache in the right temporal region. He awakens at night complaining of pain. The onset of this attack was about three weeks ago. He is reported to have had Bell's paralysis, on the right side of the face about six weeks ago. He contends that he can not see when he covers his right eye. Dr. Irvin examined him following this statement about six weeks ago and reported better vision in the right eye than in the left, and found the throat, ears and nose clear at that time. There is no pain immediately over the mastoid, but the patient complains of pain above and below the mastoid region. His temperature ranges from 96.4 to 100.4. There is no rigidity of the neck. Reflexes are normal. There is slight internal strabismus in the right eye.

Past History: The child was normally delivered, and is a bottle fed baby. He has always been a strong healthy child. He had whooping cough and chickenpox in infancy. About a year ago he had scarlet fever which left him with a running ear. Occasionally this ear stops discharging, then shortly afterward he will begin to run a little temperature, and to complain of pain until the ear discharges again and the pain is temporarily relieved. This condition has obtained almost continuously for the past year, For the last few weeks he has been on codliver oil and other tonics in an effort to build him up. His tonsils were removed and found full of pus.

Examination: The patient is a perfectly healthy appearing, well developed child. The tonsils have been removed. There is no stiffness of the neck. There are no abdominal findings. No pathology is revealed anywhere except in the right temporal region where there is tenderness. The ears are not

discharging at this time. The right ear drum is red. Photophobia is present. The child is somewhat depressed but not enough to justify a diagnosis of brain abscess. His temperature is 100.8, pulse 120, and respiration 28.

Progress: The child was carefully observed for two days following entrance into the hospital; his general condition grew worse, the fever went higher and the child became more irritable. The leukocyte count increased from 22,950 to 31,000 with 94 per cent polys. within twenty-four hours, and it was decided to operate. The mastoid was explored and some pus encountered but not enough to justify the symptoms of the child. Effort was made to establish free drainage in the hope that pus in that vicinity might drain. Ebony formation of the bone was marked throughout the mastoid region. The immediate postoperative condition was good. The following day the drainage was very slight, the temperature went to 103, and the child complained of pain in the head. His pupils were dilated and he complained on being moved. The third day after operation the patient vomited undigested food; the drainage was somewhat freer; his stools became very offensive; he was rational, although the temperature went to 105; he voided freely. It was decided to open the lateral sinus, and this was done at 9 p. m. No pus was found in the lateral sinus. He reacted well, and did not vomit following the anaesthetic. The following day he became semiconscious, involuntary bowel movements began, and his temperature went to 105. He was rational at times and took some nourishment. Marked edema of the eyelids appeared. The pulse became weak, and respiration shallow.

Consultation with Drs. Brown, May, Vance and Rawlings was held. Dr. W. L. Brown said that no infected clot being found at the time of opening the lateral sinus, he advised against additional surgery; that he did not think a surgical abscess was present. His reasons for these conclusions were lack of vomiting, choked disc or slow pulse to indicate intracranial pressure; also he said the temperature and leukocyte count seemed to be too high for local abscess. He thought, with the mastoid history, the absence of any findings in the sinus and the absence of definite symptoms of cerebral abscess, that the child was developing basal meningitis. The Gradenigo syndrome, he said, pointed in the same direction.

The symptoms of meningitis developed rapidly, convulsions followed, and the patient expired.

Cranial Autopsy (Dr. George Turner): The dura mater is adherent to the skull bone and separates with some difficulty; the dural blood vessels are congested; the right hemisphere is slightly bulging over its anterior half and is quite soft to the touch. On opening the dura in the frontal area just to the right of the falx, yellowish grey pus, about the consistency of thick cream, pours from the incision. By continuing the dural incision and opening it on the right and left of the sagittal sinus, for its full length, pus pours from over the entire surface of the right hemisphere and from between the brain substance and falx cerebri. There is no pus over the left hemisphere or on the left side except around the base and about the anterior aspect of the subtemporal lobe. There is shallow suppuration over practically all of the cortical surface of the right cerebral hemisphere. The deepest area of suppuration, and likely the first involved portion of the cortex, extends from the base along the sylvian fissure and spreads over the temporal and frontal lobes. There are no deep abscess formations. The ventricles contain no pus. The mastoid cells on the right have been removed. The middle and internal ear cavities contain pus. The petrous portion of the temporal bone shows no evidence of suppuration or that meningitis occurred by direct extension through the bone. The right superior petrosal, cavernous, inferior petrosal, circular and transverse sinuses, together with the same sinuses on the left, contain no blood but are filled with yellow creamy pus. The right lateral sinus contains nothing but blood while the left lateral contains antemortem clots.

The blood culture was sterile throughout. Smears from pus show many very small gram negative diploccocci. Dr. Rawlings was of the opinion, from the first, that the child had an abscess in the silent area.

EL PASO NEWS ITEMS

DR. W. E. VANDEVERE has reopened an office for the practice of eye, ear, nose and throat, at his old location in the Mills building after a three months' sojourn in California.

DR. W. E. JOHNSON, formerly of El Paso, and now residing in Santa Barbara, California, is reported out of danger, after having suffered from a perinephritic abscess.

DR. O. F. MAY is seriously ill at this time in Masonic Hospital, suffering from lobar pneumonia.

DR. M. G. PADEN, local surgeon for the Southern Pacific, at Carrizozo, was a professional visitor to El Paso February 18th.

DR. F. O. BARRETT has returned from Tulane University, where he did post graduate work in pediatrics for two months.

DR. L. G. WITHERSPOON is again taking care of his practice after a month's illness in William Beaumont General Hospital.

DR. O. E. BROWN, Southern Pacific surgeon, at Tucumcari, was a professional visitor in El Paso, March 1st.

DR. W. B. COFFEY, of San Francisco, the newly appointed Chief Surgeon of the Southern Pacific lines, was the guest of Dr. R. L. Ramey, Division Surgeon of the Southern Pacific, February 20th.

There was a called meeting of the division, consulting and local surgeons of the three divisions of the railroad that operate out of El Paso, and about twenty-five of the surgeons were present. Dr. Coffey not only outlined plans and policy of the medical department for the future, but gave a wonderful address on angina pectoris. At the Vienna Clinic he worked out the operation of removal of the ganglion of the sympathetic nerve, as a relief for angina pectoris. His presentation was beautifully illustrated by lantern slides of the technic of the operation and the study of the sympathetic nervous system—a series of photographs that were the product of three years of research and dissections. His highly scientific presentation was most enthusiastically received.

DR. JOHN R. WALLS, formerly of Holbrook, Ariz., has moved to Winslow, where he will be located in practice, in the future.

DR. A. C. KINGSLEY, of Superior, Ariz., has moved to Phoenix and will be located there in the future.

DR. F. B. SHARPE, of Phoenix, has returned from a year's post-graduate work at Dr. De Lee's Lying-in Hospital in Chciago. He announces that his work will be confined to obstetrics in the future. He will be located at Nos. 723-24 Heard building.

DR. D. SCOTT SCHENCK, formerly of Safford, Ariz., has moved to Douglas, where he will be located in the future.

Southwestern Medicine

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THE APRIL AND MAY MEDICAL MEETINGS IN THE SOUTHWEST.

The months of April and May represent the period when the annual medical gatherings of Arizona, New Mexico, Texas and California occur.

On April 21st to 23rd the Arizona State Medical Association will hold forth in Yuma. This is the first attempt to hold the annual Association gathering outside of the six principal cities of the state, except the one visit to the Grand Canyon. That is, in itself, a nexcellent comment on the important developments which have taken place in Yuma Valley during the past few years. The program of the Yuma meeting, printed in full herein. is a guarantee of a profitable and successful meeting.

Immediately following the Arizona meeting. the Texas State Medical Association will convene in El Paso, beginning April 25th. The fact that the El Paso County Society will have charge of the local entertainment, and the usual high class program of the Texas organization, one of the largest and best in the country, will attract many visitors from Arizona and New Mexico.

Concurrently with the Texas gathering, the California annual meeting will be held in Los Angeles, starting April 25th.

The New Mexico Medical Society's convention will be in Carlsbad, May 9th, 10th and 11th. These dates have been chosen so that a continuous trip may be planned covering this meeting and the American Medical Association in Washington, which begins on May 16th. Full program of the New Mexico meeting will be found in the next issue (April) of this journal.

DINNER IN HONOR OF DR. WIN WYLIE

On March 15th, in commemoration of the fiftieth anniversary of his entering upon the practice of medicine, a dinner was tendered by members of the medical and legal professions of Maricopa County, to Dr. Win Wylie of Phoenix. The dinner was sponsored by Dr. D. F. Harbridge, secretary of the State Medical Association, and was attended by physicians, attorneys and their wives to the number of about one hundred and fifty.

Dinner was served by the Arizona Club. Dr. J. M. Greer, president of the Maricopa County Medical Society, introduced Dr. D. F. Harbridge, who served as toastmaster. Toasts in honor of Dr. Wylie were offered by Hon. F. C. Struckmeyer, Dr. E. Payne Palmer, Hon. P. H. Hayes, Dr. Geo. M. Brockway, Hon. Samuel White and Dr. John E. Bacon, the final response being made by Dr. Wylie. Music was interspersed between the toasts, and Dr. Brockway presented, in the name of the medical and legal fraternities of Phoenix, an engraved watch to Dr. Wylie, as a token of their respect and affection.

Physicians from over the state attending the dinner included Dr. and Mrs. C. E. Yount of Prescott, Dr. and Mrs. C. R. Swackhamer of Superior, Dr. F. C. Todt of Kingman, Dr. and Mrs. John E. Bacon of Miami. Many telegrams from other physicians, expressing their regret in not being able to be present, and offering their congratulations, were read by the toastmaster.

The closing toast, offered by Dr. Harbridge, was as follows:

"Here's to a man old in years, yet young in vitality and alertness. Here's to a man grown old in the experience of medicine and

law, yet young in its modernized practices. We salute you, Dr. Win Wylie, and may the years of the future be filled with that mellowness which comes to one conscious of having fulfilled with distinction his stewardship. God doubtless could have made a better doctor, but doubtless God never did."

DINNER FOR DR. W. B. COFFEY

On February 15th, on the occasion of the visit of Dr. Walter B. Coffey, of San Francisco, the newly appointed Chief Surgeon of the Southern Pacific Lines, to Phoenix, a dinner was held in his honor at the Arizona Club. This was arranged by Dr. George M. Brockway, District Surgeon, and was attended by the following local and consulting surgeons, in addition to Dr. Coffey and Dr. Brockway: Drs. Win Wylie of Phoenix, A. M. Tuthill of Phoenix, James E. Drane of Phoenix, D. F. Harbridge of Phoenix, Wm. A. Schwartz of Phoenix, W. O. Sweek of Phoenix, W. Warner Watkins of Phoenix, and J. O. Ollerton of Mesa.

Following the dinner, served in a private dining room at the Club, Dr. Coffey spoke very entertainingly about his plans for handling the industrial work of the Southern Pacific. He complimented the hospital and laboratory facilities in Phoenix and stated that the local and district surgeons would have more responsibility in the future than they had been allowed in the past. He stated that the welfare of the injured workman was to be paramount in all cases handled, and cases that could be handled more satisfactorily by local surgeons would be left in their hands.

LOGAN D. DAMERON

The list of pioneer medical men of Arizona is dwindling year by year. With the passing of Dr. Logan D. Dameron, of Phoenix, there remains only one living member of the group of charter members of the Arizona Territorial Medical Association, organized on May 25, 1892. This remaining member is Dr. H. A. Hughes, of Phoenix, the father-in-law of Dr. Dameron.

Dr. L. D. Dameron was born in Missouri in 1867, receiving his medical education at the Hospital College of Medicine, Louisville (now merged with the University of Louisville) in 1891, coming directly to Phoenix in that year. He was secretary of the Maricopa County Medical Society in 1892, when the small group of physicians in that society issued the invitation to the other physicians of the state to organize the territorial association, the organization meeting taking place in Phoenix on May 25, 1892. Dr. Dameron was the secretary of the Territorial Association in 1893, and served as its president in 1903. It was in this eventful year that the Medical Practice Act was passed by the Territorial Legislature.

Dr. Dameron was associated in practice with Dr. H. A. Hughes, his wife, who survives him, being a daughter of this pioneer physician. Six years ago, Dr. Dameron suffered a cerebral hemorrhage while sitting at his office desk. He partially recovered from this, but was left with a hemiplegia. After two years he resumed practice and for the past three years has filled the position of Health Officer for the City of Phoenix. His death was due to a second attack of apoplexy, while on a visit at the home of his daughter in Los Angeles. He is survived by his wife, a son who is a practicing dentist in Phoenix, and a daughter who lives in Los Angeles.

Universally loved and respected, a long and honorable career as a physician, Christian citizen, and friend of thousands, has come to a close; the entire medical profession of Arizona will mourn his passing.

JAMES A. OLLERTON

The untimely death of Doctor James A. Ollerton, of Mesa, Ariz., came as a shock to his many friends and confreres of central Arizona. From some unknown source he contracted a fulminating typhoid which resulted fatally in less than two weeks.

Dr. Ollerton located in Mesa in September, 1925, after graduation from University of California Medical College, and very rapidly established himself in the community by his ability and faithful attention to duty. He was a member of the Maricopa County Medical Society and the State Association. He was City Health Commissioner for the town of Mesa. He was a capable physician, held in high esteem by the medical profession of his community, who join in sympathy with his bereaved family.

HARRY S. SQUIRES

Dr. Harry S. Squires died at his home in El Paso, Texas, January 16, 1927, at 2 p. m. He was born in 1856 at Bennington, Vermont; graduated in medicine at Harvard University in 1878. In 1881 he went to Mexico and for 23 years was Chief Surgeon of the Mexican Central Railroad. He remained at the head of the Hospital Service of this railroad until his retirement, ten years ago, when he moved to El Paso, making that his home until the time of his death. He is survived by his widow.

Arizona State Medical Association

Thirty-Sixth Annual Meeting

Yuma, Arizona, April 21, 22 and 23

HEADQUARTERS—HOTEL DEL MING

Headquarters:—The official headquarters and registration bureau will be at the new Hotel del Ming, which is on the bluff overlooking the river.

Entertainment:—The Yuma County Medical Society will be the hosts of the Association. They have not yet announced the details of the social entertainment, but it is safe to say that these features will be unique and thoroughly enjoyable.

Papers:—All papers read before the Association will be limited to TWENTY MINUTES in presentation. Authors are requested to govern themselves accordingly and not suffer the embarrassment of having time called on them. When lantern slides are to be shown. the reading of paper and demonstration of slides must all come within the time limit.

All papers read before the Association become the property of the Association and are to be turned over to the secretary for publication in the official journal,—SOUTHWESTERN MEDICINE.

Discussions:—Opening and closing discussions are limited to FIVE MINUTES; other discussions to THREE MINUTES.

In the program below, a brief synopsis has been furnished for each of the papers, wherever this could be obtained. Members who expect to attend the Yuma meeting are asked to read thees synopses and communicate with Dr. Chas. S. Vivian, Goodrich Building, Phoenix, in case they desire to open discussion on any of these papers. This communication should be sent to him immediately, so these names may appear in the final program.

Reservations:—Make reservations immediately, if you expect to secure accommodations at the Hotel del Ming.

PROGRAM

THURSDAY, APRIL 21

Council Meeting, 9 a. m.

MORNING SESSION, 10 A. M.

Invocation.
Addresses of Welcome.
Introduction of President.

1. FRANK J. MILLOY, M. D., - - Phoenix, Arizona
"Blood Transfusions."
Description of method with results of sixty transfusions.

Discussion.

2. A. B. COOKE, M. D., - - Los Angeles, California
"The Use and Abuse of Iodine in the Treatment of Goiter."
That iodine has a place in the treatment of goiter is one of the established truths of modern therapy, but its indiscriminate use constitutes a growing menace. The proper use of iodine: (1) as a preventive, (2) in the treatment of nontoxic goiter, (3) in the treatment of toxic goiter. Discussion of the different types of goiter and the importance of accurate differential diagnosis before exhibiting iodine. The abuse of iodine: (1) the failure to realize the indications for the remedy and its clear cut limitations, (2) the tendency to regard it as a curative agent in the management of toxic cases, and (3) the commercial exploitation of iodine.

3. ROSS MOORE, M. D., - - Los Angeles, California
"A Consideration of Certain More or Less Intangible Thyroid Manifestations."
Thyroid relationships to nervous and mental symptomatology are sketched briefly. One or two cases are then discussed in an effort to reach a more accurate quantitative and qualitative estimate of irregular thyroid activity.

Discussion of papers of Drs. Cooke and Moore.

AFTERNOON SESSION, 1:30 P. M.

4. *Demonstration of Case History Analysis and Discussion.*
(Presentation of the "Yavapai Plan" of case history study by the group plan, as devised by the Yavapai County Medical Society and the Staff Officers of Fort Whipple Hospital.)

5. C. A. THOMAS, M. D., - - - - Tucson, Arizona
"Treatment of Conditions in the Abdomen with Generalized Peritonitis."
Long Incision left open and used for purpose of drainage. Positioning of the patient. Large quantities of saline per rectum.

Discussion.

6. STUART PRITCHARD, M. D., Battle Creek, Mich.
"Thoracic Pain."
Importance of thoracic pain in diagnosis and therapeutics. Discussion of affections of thoracic walls reflecting pain. What is intercostal neuralgia? Influence of certain toxins as causative factors. Discussion of neuritis and neuralgia. Discussion of different types of pleural pain. Disease of cord or vertebrae involving spinal roots (radicular pain). Discussion of source of pain.

Discussion.

7. BERNARD L. MELTON, M. D., Phoenix, Arizona
"Headache of Ocular Origin."
Frequency and character of ocular headache; differential diagnosis; causes of ocular headache; refractive errors; disturbances of extra-ocular muscles; eye diseases; illumination faults; neurasthenia and hysteria; poor health and poor hygiene; mechanism of production of ocular headache; treatment; conclusions.

Discussion.

Executive Session of House of Delegates.

THURSDAY EVENING

Social Entertainment by Yuma County Medical Society.

FRIDAY, APRIL 22

MORNING SESSION, 9:30 A. M.

8. A. A. SHELLEY, M. D., - - - Phoenix, Arizona
"Granuloma Fungoides, with Report of Case."

"A rare, chronic, malignant disease, characterized in the early months or years by eczematous lesions, which later become infiltrated, with the subsequent appearance of papules, nodules or tumors, with formation of mushroom-like ulceration, usually going on to fatal termination. Report of case of extensive and rather typical lesions which ran a course of some years, exhibiting all the stages in the course of the disease; the failure of all treatment until the prognosis was alarming, and apparent cure by x-ray treatment.

Discussion of this paper to be opened by
W. WARNER WATKINS, M D., Phoenix, Arizona

9. M. C. COMER, M. D., - - - - Tucson, Arizona
"Report of Six Unusual Cases."

1. Screw-worm infestation of the nares. 2. Patent thymic duct or branchial or lateral cervical fistula. 3. Sudden death in child simulating status lymphaticus. 4. Acute pericarditis with effusion, a sequel to subacute sinusitis. 5. Death from furuncle of the anterior nares. 6. Mastoiditis, acute purulent, without purulent infection of the middle ear. Lantern slides.

Discussion of this paper to be opened by
JOHN J. MCLOONE, M. D., - Phoenix, Arizona

10. R. J. STROUD, M. D., - - - - Tempe, Arizona
"Myiasis in the Southwest, with Particular Reference to the Species Crysomyia Marcellaria."

Sixteen cases seen by the author with one death. Etiology and method of transmission. Parts attacked. Treatment with special reference to the nose. Prevention. Syphilitic relationship. Report of cases and their peculiarities.

Discussion of this paper to be opened by
C. E. YOUNT, M. D., - - - Prescott, Arizona

11. WALTER BERNARD COFFEY, M. D., San Francisco
Chief Surgeon Southern Pacific Railway.
"Treatment of Anginal Pain by Injection of the Cervical Sympathetic Ganglion."

AFTERNOON SESSION, 1:30 P. M.

12. E. G. COLBY, M. D., - - San Diego, California
"Brittle Bones and Blue Sclera."

Discussion of nomenclature. Resume of literature. Presentation of four cases with history of twenty-eight other members of family.
Discussion.

13. ORVILLE HARRY BROWN, M. D., Phoenix, Arizona
"Some Fundamental Principles of Diet."

Much false information about diet regularly reaches the public and frequently has undue influence; also members of the profession are now and again confused on facts. Examples of the fact that physicians do not get correct principles in diet at all times is the ordinary hospital diet lists, variously designated liquid, soft, regular, etc. Sansum's work upon acid and alkali ash foods and their significance, Allen's results with salt free diets, and other modern advancements.

Discussion.

14. NELSON D. BRAYTON, M. D. - - Miami, Arizona
"Lupus Vulgaris."

Report of Case Originating in Arizona, with presentation of patient and discussion of the disease.

Discussion.

15. STERLING N. PIERCE, M. D., Los Angeles, Calif.
"The Low or Cervical Transperitoneal Cesarean Section."

The transperitoneal cesarean section offers hope to those who are trying to reduce the maternal mortality incident to the so-called classical cesarean section. It can be as safely performed after as before the onset of labor. The danger of peritonitis in the delayed cases is eliminated because the wound in the uterus is covered with peritoneal flaps. Intestines are spared exposure and trauma. Position of the wound promotes healing. Detailed description of the operation, with lantern slides.

Discussion.

Executive Session of the House of Delegates.

FRIDAY EVENING

Social Entertainment by the Yuma County Medical Society.

SATURDAY, APRIL 23

Council Meeting, 9 a. m.

MORNING SESSION, 10 A. M.

16. CHARLES S. VIVIAN, M. D., Phoenix, Arizona
President's Address.

17. ROBERT V. DAY, M. D., Los Angeles, California
"Margin of Safety in Urological Operations."

Principal dangers in urologic operations generally; hemorrhage, shock, infection, uremia, pneumonia, myocardial and vascular disease, embolism; types of anesthesia as factors. Specific pathology; comparative dangers of suprapubic and perineal prostatectomy. Punch operations on the bladder neck; relative danger of the open and various closed methods. Operations for urethral stricture. Other factors concerned in estimating dangers of urethrotomy; urinary infiltration; tumors of the bladder; vesical diverticula; renal tuberculosis; stones; concomitant hypertension and toxic nephritis; operations on infants and children.

Discussion of papers of Drs. Vivian and Day by
W. G. SCHU..TZ, M. D., - - Tucson, Arizona

18. M. C. HARDING, M. D., San Diego, California
"Bunions; Different Types, Different Treatment."

Halux valgus; metatarsum varum and displaced sesamoids; osteo-arthritic enlargements; halux rigidus; appropriate operations.

19. W. WARNER WATKINS, M. D. AND HARLAN P. MILLS, M. D. - - - - - - Phoenix, Arizona
"Cooperation Between Clinician and Laboratory."

In order to secure the greatest possible results from the clinical laboratory, three things are essential: (1) A clinician alive to the possibilities of clinical laboratory methods; (2) laboratory pathologists who can direct the inquiry into the proper paths from the laboratory standpoint, and correctly interpret for the clinician the results obtained, if this is desired; (3) cooperation on the basis of consultation, mutual confidence and respect, between the clinician and pathologist, to secure the desired end results.

Discussion.

20. F. T. FAHLEN, M. D., - - - Phoenix, Arizona
"Cardio-Vascular Disease."
Discussion.

21. CLARENCE E. REES, M. D., San Diego, California
"Cautery in Treatment of Cancer."

Summary public campaign for the prevention of cancer. Lack of agreement and means in the profession generally for treating precancerous and early lesions. Necessity for means of treating precancerous lesions by physicians who first see them. Outline of simple method that can be used by any one. Method of using cautery in operable and advanced lesions. Comparative value with other methods. Case reports.

22. E. W. PHILLIPS, M. D., - - Phoenix, Arizona
"Orris Coryza."

Orris root is a common cause of hay fever in women; failure to recognize this is a frequent cause of failure in treating hay fever patients. Review of 105 cases carefully tested for this sensitization. Orris coryza usually takes the form of seasonal hay fever with irregular onset date and with marked variability in severity of symptoms. All women with hay fever or with stubborn rhinitis not clearly traceable to infection should be tested for this sensitization. Conclusions.

Discussion.

Open Meeting of the House of Delegates.

DEACONESS HOSPITAL (Phoenix) INSTALLS RESIDENT PHYSICIAN.

On account of the technical requirements, none of the hospitals in Arizona have succeeded in being placed on the list of "Hospitals Approved for Interneships." To meet the need for the kind of service supplied by internes, the Deaconess Hospital at Phoenix has installed a resident physician. Dr. Jesse D. Hamer has been secured to fill this place. Dr. Hamer received his medical training at the Western Reserve School of Medicine of Cleveland, with several months service at the Cleveland City Hospital. He is twenty-eight years of age, married, and in good health. The staff of the hospital are enjoying the assistance afforded by his services in the hospital, and he will no doubt find there the same valuable experience which a regular interneship would afford.

GRANT COUNTY (N. M.) MEDICAL SOCIETY

Regular meeting of the Grant County Medical Society was held February 25, at the Officers' Club, Fort Bayard, N. M., at 8 p. m., Dr. Kramer presiding.

The roll call showed the following present: Drs. Kramer, Wood, Groom, McFarland, Hubbard, Groves, Gunter, Lacy, Frazin and Mr. Stockton.

Minutes of the last session were then read and approved without change.

Clinical cases: Drs. Danielson and Carlbard were unable to be present with their cases as scheduled. Dr. Wood presented a case of dextro-cardia resulting from hydro-pneumothorax, left.

Papers: Dr. Hubbard's lecture, with stereoptican views of foreign bodies in the trachea and esophagus, was intensely interesting and beneficial to all present.

Communications: A letter was read from Dr. Yater concerning "Board of Examiners in the Healing Arts of the State of New Mexico." It was moved and carried that the Grant County Medical Society is heartily in sympathy with such a board of examiners, and this society resolves to write a letter similar to that written by the Chaves County Medical Society, the same to be sent to our state representatives.

The meeting adjourned at 10:15 p. m.

J. P. Wood, Secretary.

EL PASO COUNTY MEDICAL SOCIETY

The El Paso County Medical Society met in the First National Bank building, February 14th, with the president, Dr. E. B. Rogers, in the chair.

The paper of the evening was a presentation of "Peptic Ulcer," by MAJOR HARRY G. WYER. It was a paper that had been prepared for instruction of the junior officers of the Medical Corps of the

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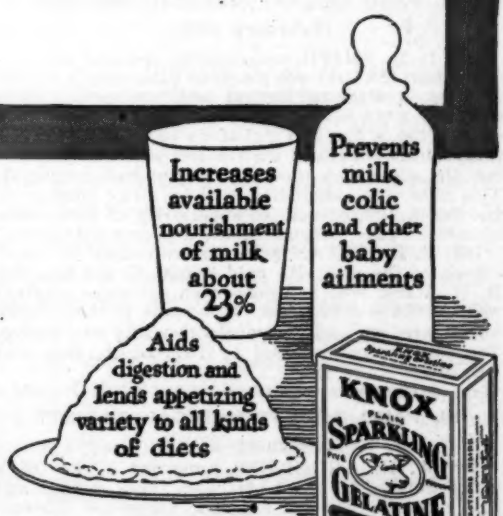
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Army. It was a delightful resume of the literature; it not only revealed modern diagnosis and management, but presented the theories as to etiology in such a way as to leave with his listeners much food for thought and debate.

In the discussion of the paper, DR. R. B. HOMAN recited personal experience as a sufferer from extensive hemorrhage due to peptic ulcer. From this experience he formed three conclusions; the first impression was the seriousness of the condition; this provoked fear, and, when once frightened, he was a perfectly cooperative patient.

DR. JAMES VANCE said that ulcers should first be considered a medical problem, and the conservative measures incident to medical management should first be attempted. Surgery can be employed at any time and should, therefore, be considered late, and not early. The true surgical case, and the one that invariably has given him good results, has been the one in which medical treatment failed.

DR. P. R. CASELLAS stated that up to the time of the Sippy monograph little aid had been given diagnosis by the x-ray. However, since that splen- work of Sippy, x-ray has come to be the pivotal point on which the diagnosis rests. He emphasized the study of the peristaltic wave in ulcer. The x-ray can determine the perforative type which is the type that is surgical; the indurative type as determined by the x-ray, is medical.

DR. HARRY LEIGH cited the work of Merriott, who showed that by raising the hydrogen ion content of the stomach by diet to Ph 3, the stomach became sterile. It should follow from this work that reduction of the acidity by alkalies might possibly increase bacterial growth.

MAJOR WYER, in closing, stated that the motive of the paper was to arouse interest in etiological study.

EL PASO COUNTY MEDICAL SOCIETY

(February 20th)

DR. L. M. SMITH reported two cases of skin tuberculosis; the first was a case of tuberculosis venosa cutis in a Mexican boy of fourteen years. Subintensive x-ray has apparently produced a cure. The second case, a Mexican girl of six years with cervical tuberculosis adenitis. On the left side and just below the glands an ulcerative lesion had developed. This case was responding well to x-ray treatment. Dr. Smith pointed out the superiority of x-ray over ultraviolet rays, because of the deeper penetrability.

DR. R. B. HOMAN presented two cases of tuberculosis of the eye. He paid tribute to the late Dr. H. H. Stark, who had done such extensive original work in these conditions. Symptoms in these cases had cleared up under careful tuberculin medication. The cases were discussed by Drs. Leigh, May and Werley.

EL PASO COUNTY MEDICAL SOCIETY

(February 28th.)

Dr. W. H. ANDERSON presented a case of a white woman, 42 years old, who, three months ago had extensive cervical adenitis, diagnosed tuberculosis. Under three months of treatment by the carbon light, glands were completely reduced, being non-palpable.

DR. GEORGE TURNER presented a pathological display of several cases, a full report of which appears under report of the Masonic Hospital Staff meeting. A case not reported there was one of a middle aged man who died suddenly, apparently of pulmonary hemorrhage. At autopsy the lungs were found negative; there was extensive syphilitic aortitis with aneurysm of the descending aorta which had eroded into dorsal vertebrae and to the root of the right lung. The aneurysm had ruptured into a large bronchus, which was responsible for the death, and the appearance of a massive pulmonary hemorrhage.

DR. W. W. WAITE reported two cases of death due to congenital heart lesions. One was a child in which there was a patent foramen ovale; the other a case of perforated heart septum. Dr. Waite stated that there were no other apparent lesions and that these children possibly died from some slight exposure. These cases do very well until exposed to marked temperature change, in which case the heart is unable to cope with the additional strain, and the child succumbs. The very interesting specimens were displayed. As a part of this exhibition, DR. HARRY LEIGH presented drawings he had made showing the embryological development of the heart and the faulty developments that produce the congenital anomalies, the arrest of development at some particular stage producing the anomaly. The literature shows 149 different anomalies.

In discussion of the case DR. WERLEY stated that 50 per cent of patients with congenital heart lesions are either born dead or live but a few days; however, there are a number of congenital defects that do not shorten life. He named patent intraventricular septum, patent ductus arteriosus, and pulmonary stenosis. In patent foramen ovale he stated that the prognosis was less favorable. The cases were further discussed by Drs. Waller, Leigh, Werley and Laws.

DR. J. W. LAWS presented a case of advanced tuberculosis that developed frequent urination, and upon examination of the urine a fecal odor was detected. Dr. Jamieson was called to do a cystoscopic examination and found a fistula in the bladder that communicated with the rectum. The case came to

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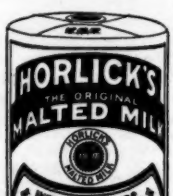

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Systemic ultraviolet irradiation with Air-Cooled Quartz Lamp, for malnutrition.

Diathermy for pain, following fracture of forearm.

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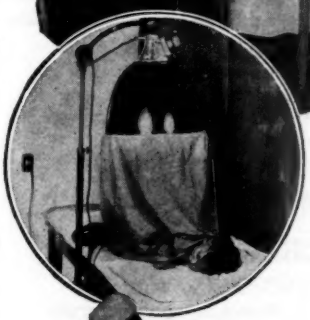

Phototherapy for pain in back following muscular injury.

Ultraviolet irradiation with Water-Cooled Quartz Lamp in treatment of chronic otitis media.

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IN the Dec. 11th issue of the Journal of A. M. A. were printed the Official Rules of the Council of Physical Therapy of the American Medical Association. These official rules "have been adopted primarily with the view to protecting the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connection with the manufacture and sale of apparatus and methods for physical therapeutic treatment."

Quoting further from the A. M. A. Bulletin of the House of Delegates: "It is hoped that the medical profession will give consistent support to this effort for sound therapy. Physicians may well follow in their choice of apparatus and in their work the opinions of the Council on Physical Therapy as to what is reliable."

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autopsy and the specimens presented showed a nodular tuberculous cecum; there were ulcers in the sigmoid extending to the rectum, and it was one of these ulcers that had perforated into the bladder.

ST. JOSEPH'S HOSPITAL STAFF MEETING.

(Phoenix, Feb. 14, 1927.)

The regular staff conference of St. Joseph's Hospital, Phoenix, Ariz., was attended by fifty-two people, including forty-six members of the staff, three members of the hospital organization, and three visitors. Among the visitors was Dr. Franklin Martin, Director General of the American College of Surgeons.

The program presented was in charge of Dr. Kimball Bannister and covered a critical review of the obstetrical work in the two hospitals in Phoenix during the years 1925 and 1926. About 770 cases were reviewed, and the following phases of obstetrical practice were covered:

"Conditions with Indications and Contra-Indications for the Use of Forceps." Dr. R. W. Eaton. Discussion opened by Dr. A. J. McIntyre.

"Conditions with Indications and Contra-Indications for Cesarian Section," Dr. E. R. Charvoz. Discussion opened by Dr. J. M. Greer.

"Management of Eclampsia and the Pre-Eclamptic State," Dr. Dudley Fournier. Discussion opened by Dr. A. M. Tuthill.

"Critical Study of Obstetrical Deaths in the Two Hospitals for 1925 and 1926," Dr. John Wix Thomas.

"Are We Practicing Good Obstetrics?" (Comparison of Phoenix hospital records with those of obstetrical departments of large hospitals elsewhere), Dr. Kimball Bannister.

"Comments on Obstetrical Records," Dr. W. W. Watkins.

Following the completion of this program, Mr. Crutchfield, a field worker for the Gorgas Memorial, was introduced and spoke for a few minutes.

Dr. Franklin Martin then addressed the staff for about twenty-five minutes, chiefly on the importance of the work of the Gorgas Memorial.

Adjournment at 10:25 p. m.

W. Warner Watkins, Secretary.

STAFF MEETING OF EL PASO CITY-COUNTY HOSPITAL

The staff of the El Paso City-County Hospital met at 6:30 p. m., February 16th. The following members were present: Drs. Cuming, Strong, Von Almen, Barrett, May, Barnes, Wilson, Long, Gallagher, Jamieson, W. Rogers, Cathcart, Stevenson, Molloy, Varner, Thompson, Werley, Casellas, Turner, and Smith.

The business of the staff was transacted, and the following cases, which died in the hospital during the preceding month were reported:

DR. GALLAGHER reported the case of a woman admitted January 18th on account of increasing dementia for the past year, and a mass in the abdomen. The temperature was 99.4 to 99.8. The patient was semiconscious on admission. Reflexes of the arms and legs were increased. Pupils were negative. There was a mass extending from the pubis to the umbilicus. The preoperative diagnosis was paresis and fibroid. On operation a purulent cystic right kidney and bilateral salpingitis were found. Saline

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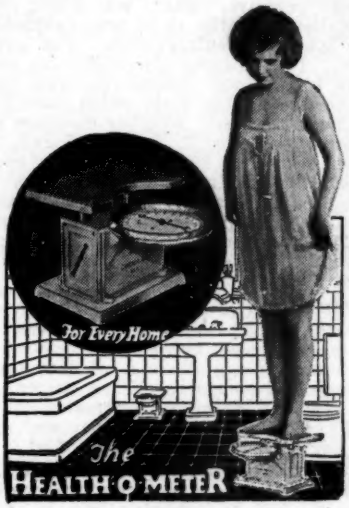

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solution was given in the thighs, 250 c.c. every four hours. The patient refused food and died of inanition. The temperature before death was 102.4.

DR. WERLEY reported the death of a negro man, aged 66, who came to the hospital with marked ascites and gasping for breath. The urine was normal. The blood pressure was 175/105. There was a temporary improvement from digitalis, but the patient died. The diagnosis was essential hypertension.

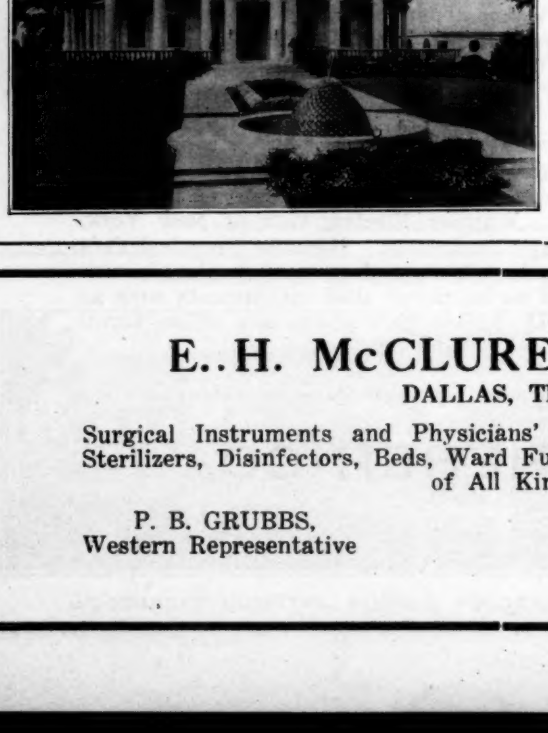
DR. STEVENSON reported a case of a patient who was accidentally shot thru the umbilicus. The patient was very weak. The pulse was feeble and rapid. X-ray examination showed the bullet in the pelvis. At operation many perforations were found in the mesentery, transverse colon, and small intestine. The perforations were repaired, but the patient died in 36 hours, presumably from hemorrhage.

DR. STEVENS reported a case, of a patient who came in with history of difficult and painful urination for six months. There had been no urination or defecation for five days. Examination showed a negative chest; sclerotic arteries; distended abdomen with a mass in the lower part, flat on percussion; an enlarged prostate; a urethral stricture of small calibre. Diagnosis: Intestinal obstruction. On operation, appendicitis and total obstruction at ilcocecal valve were found. There were old adhesions at the ileocecal valve and at the splenic flexure. The terminal end of the ileum was gangrenous. Appendectomy was performed. The patient died the morning after the operation. Pathologic examination of the appendix showed the wall infiltrated with polynuclear and round cells, with scar tissue present. Pathologic diagnosis: acute and chronic appendicitis.

DR. BARRETT reported the death of a child admitted December 24th, with a history of fever and night crying for 14 days. The patient was semicomatose; the eyes were set, the neck rigid. The heart, lungs, abdomen, skin, and genito-urinary organs were negative. There was slight pharyngeal inflammation, and the child was dyspneic. There was no glandular enlargement. The pupils were sluggish. The working diagnosis was meningitis, probably tuberculous. Spinal puncture on December 24 showed a clear fluid which gave a negative Wassermann reaction. Another puncture was made December 27th. No. T. B. were found. The cell count was increased, although the exact count is not recorded. The treatment was directed at relieving the tension and giving as much feeding as possible. The patient died in convulsions with opithotonus. A final diagnosis of tuberculous meningitis was made on the strength of the increased count with the clear fluid.

DR. THOMPSON reported a death from bichloride poisoning. The patient took seven bichloride tablets by mistake. The stomach was washed and the patient given egg albumen. Sodium thiosulphate was given intravenously. The patient vomited bright blood all along. Suppression of urine developed. Hot packs, pilocarpine, and hemostatic serum were given, but the patient died.

DR. THOMPSON also reported a death from tetanus which followed a dog bite two weeks before. The patient had been having pain in the leg and fever for several days, and was becoming very nervous. Pain traveled from the leg to the thigh, and then to the spine. The patient had had spasms for five days. The symptoms developed too soon for



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hydrophobia. A total of 35,000 units of tetanus antitoxin intraspinally, and 30,000 intravenously was given. Antitoxin had not been administered at the clinic when the wound was dressed. Tetanus bacilli were grown from a piece of clothing taken from the wound.

DR. TURNER, in discussing this case, stressed the necessity of giving antitoxin in all cases of punctured wounds, especially when the wound is thru the clothing. DR. LONG stated that there is not as much tetanus in dry climates as there is where here is more moisture. DR. STEVENSON can recall very few cases of tetanus in this city. He estimates that not one per cent of wound cases develop tetanus here. DR. CASELLAS stated that in Porto Rico tetanus is very common, and that antitoxin is not considered of value in treatment there. The treatment used there consists of the intravenous administration of 50 grams of magnesium sulphate in a ten per cent solution, with one half drop phenol added. This is repeated in six or eight hours. The dose is diminished or increased according to the amount of rigidity. If this treatment is begun early the mortality is low.

DR. BARRETT recited the successful experience of one authority with intramuscular injections of three minims of saturated solution of phenol in ten minims of water.

DR. WERLEY emphasized the importance of keeping these patients in a dark room. He stated that in Omaha they are treated in a tunnel, and the results there are good.

DR. THOMPSON stated that most authorities say magnesium sulphate has no effect on the infection, but acts as a hypnotic and relaxes the spasms. Antitoxin in small doses is useless, but is curative in large doses.

DR. MOLLOY said that where the tetanus incidence is highest the mortality is lowest. He raised the question of the influence of sunshine on the low incidence of tetanus in this portion of the country.

DR. TURNER thought that the abundant sunshine here was the cause of the scarcity of tetanus. For the same reason there are less bacteria of other kinds.

DR. CASELLAS thinks the sunshine has little to do with it, as the tetanus bacilli are anerobic and the ultraviolet rays are not sufficiently penetrating to reach them. This part of the country is largely non-agricultural, and the tetanus bacilli live best in cultivated land, where they are buried.

DR. LONG emphasized the necessity of opening and cauterizing all wounds.

DR. CASELLAS quotes Hess as saying that Porto Rico has more sunshine than any other country. In spite of this the tetanus incidence there is high.

DR. THOMPSON said that opening and cleaning out is as important as any other part of the treatment.

DR. VARNER reported the case of an unmarried girl, aged 22, admitted January 7, eight months pregnant. There was a history of twenty-five convulsions since the night before. The patient was comatose on admission, and the temperature was 100.4. Later in the day the temperature was 103 and the pulse 104. There were three convulsions after admission. The stomach and colon were washed out and four ounces of castor oil put in the stomach. The patient went in labor and delivered normally, but the baby was dead. The blood pressure was 190/140 on admission. Salts and fluids were given. The next day the patient was better. The urine at this time contained albumen. The morning after delivery the patient was semiconscious. The blood pressure was 120/70. At 10 a. m. the next day temperature was 104 and the pulse 130. At 6 p. m. the temperature was 106. The patient then died. Dr. Varner said he was unable to account for the rapid drop in blood pressure. This patient had very little edema. Cases with edema have a better prognosis. Diagnosis: Eclampsia.

DR. JAMIESON stated that he does not think it a good idea to push fluids in edema cases. Dr. Werley and Dr. Varner did not agree with Dr. Jamieson on this point.

Dr. Varner reported two other stillbirths.

DR. ARONSON reported the death of a boy two and a half years old from skull fracture. The fracture involved the nose and maxilla. There was bleeding from the left nostril. The pupils were unequal. Adrenalin and hypodermoclyses were given, but the patient died in two or three hours.

The staff adjourned at 9 p. m.

L. M. Smith, Secretary.

ARIZONA-GRAPHS

By Dr. W. V. Whitmore, Tucson, Ariz.

Note:—At the dinner-dance tendered the Association by the Pima County Medical Society, on the occasion of the Twelfth Ennual meeting of the Medical & Surgical Association of the Southwest, held in Tucson, November 12 to 14, 1926, the following introductory remarks, prepared by Dr. Whitmore, as Toastmaster, were not delivered, owing to the late arrival of guests. They are published here, on account of their general interest.)

NATURAL

1. The Grand Canyon of the Colorado is the most stupendous and astounding of the natural wonders of the world—the greatest gash in the earth's crust—a gigantic chasm one mile deep, 13 miles across and 200 miles long.

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2. Arizona is noted for its climate. Fortunately we have all varieties. This was well expressed by the preacher, who was sent to Tucson in early days. He served out his year and resigned, saying; "It is no use to preach in Tucson. For nine months of the year Heaven has no attractions, and for the other three, Hell holds no horrors." The rest of the state has only two kinds of climate, viz. the ideal and the "unusual."

3. We have the Petrified Forest—an unrivaled gem in nature's laboratory. The only place in the world, as far as I am aware, where in the branches of the petrified trees, the petrified birds warble their petrified songs.

4. Near the station at Canyon Diablo an immense meteor has caused a hole in the surface of the earth 3,900 feet in diameter and 600 feet deep, 1,000,000 tons of sandstone were displaced by the impact of this celestial visitor. Within five miles of this crater more fragments of meteoric iron have been found than in any other part of the world. The microscopic diamonds, frequently found in meteoric iron, were first discovered in Arizona specimens.

5. On our northern plateau we have one largest pine forest in the United States. And in the northeastern section of the state is the largest natural bridge in the world.

6. We have the Hassayampa River—famed in song and story as a stream of water, from which when one has once imbibed, he is thereafter rendered immune from telling the truth.

7. Arizona's sunshine is really her most valuable asset. There are times when we may feel over-supplied with this blessing. Many of you know—or some of you have seen—the notice upon the hotel at Yuma: "Free meals any day the sun does not shine." During the past year there was such a day, the first in 50 years. Two weeks ago the weather bureau announced fog in Yuma—that during the recent political campaign—but was the first recorded in 57 years.

ACQUIRED

1. Arizona is of especial interest to the Archeologist and Ethnologist. There are several reasons The oldest building in the United States stands 70 miles to the north of us—Casa Grande—a large four-story adobe building which was in ruins when Coronado made his famous expedition through this section in 1540.

Arizona and New Mexico have more cliff dwellings to the square inch than any section of the country.

Rather recently we have been hearing about cave dwellers. In some cases 100 rooms have been unearthed, usually underneath the cliff dwellings—being several centuries earlier.

Whole villages have recently been uncovered, especially in New Mexico, which must have accommodated over 1000 people.

From the Casa Grande ruins, the cliff dwellings and the uncovered villages, evidence is found of a civilization centuries before the birth of Columbus and antedating even the Aztec and Toltec periods.

2. Nine miles south of us stands one of the oldest, most beautiful and best preserved Spanish Missions upon the North American continent.

3. Arizona is of special interest to the geologist. The Grand Canyon furnishes the best illustration of the formation of the earth's crust, and, at the same time the greatest example of erosion in the world. Only a few weeks ago, one of the geologists of the University stated that the Tucson Mountains contained some of the oldest rocks in America. On almost the same day our archeologist, by the discovery of stone implements in a

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certain stratum of earth, in Cochise County, is convinced that man must have inhabited this section thousands of years before he is generally supposed to have done so.

Only this week one of the leading newspapers of California announced that several members of the faculty at Harvard advised a student desiring to specialize in archeology that, in their opinion, the most comprehensive course in that line could be had under Dean Byron Cummings at the University of Arizona, adding that Dean Cummings was a national authority and that Arizona was an archeological laboratory in itself. This reputation must have been attractive to that student, for he walked from Peabody, Mass., to Tucson, Arizona, early this fall.

4. Our cloudless sky and clear atmosphere make this section unrivaled for the study of astronomy. The description of a comet, designated as "a" comet of 1910, given by our astronomer was the one accepted by European scientists.

5. On the edge of our pine forest, already referred to, stands the largest saw-mill in the world.

6. For 15 years Arizona has produced more copper than any other state—producing about 50% of that in this country and 25% of that produced in the world.

At the completion of the Roosevelt Dam, that structure impounded the largest artificial lake in the world. This project is the only one of its kind that has proved unqualifiedly successful. Of course, a region which permits of 6, 8 or 10 crops of alfalfa each year, for example, is much more favorable than the north, where one or two crops a year is the limit.

8. At the time of admission to statehood—fourteen years ago—we averaged 1¾ inhabitant to the square mile. From 1910 to 1920 Arizona gained in population over 63%—exceeding every other state. We still have room. About three years ago, a popular monthly magazine gave a resume of the medical situation of the country. This statement occurred; "In Arizona a doctor enjoys the unopposed practice of 11,341 square miles." This would seem to give weight to the Englishman's conclusion, viz. "In Arizona there is absolutely not a thing but 'expawnse'."

Many of you are familiar with the Irishman's toast: "Here's to Arizona, with its broad rivers—and no water; with its immense herds of cattle—and no milk; a region where one can look further—and see less—than any state in the Union."

I will close with a personal allusion. In the early days of my residence here, about the only sentiment heard concerning Arizona was: "The land that God forgot." This expression was heard quite occasionally for some 10 to 15 years. No intimation of anything to the contrary made it rather natural to assume that there must be some foundation for such statements. But with the passage of time, with the expression no longer prevalent and with the gradual reception and appreciation of these features I have enumerated came slowly quite a radical change of ideas. I am free to admit that I have now come to accept the views of the modern theologians, viz., that the Creator spent the whole six days upon Arizona, and the rest of the world is a mere happen-stance.

BOOK REVIEWS

Prohibition at Its Worst, by Irving Fisher, Professor of Economics, Yale University; author of Stabilizing the Dollar, The Purchasing Power of Money, How to Live, etc.; The Macmillan Co., Publishers, New York.

The second edition of this book was needed within a week after the first edition was off the press.

Professor Fisher has been collecting data upon the liquor question for the past twenty-five years and in this time he has radically changed his attitude toward it. This book is a direct outgrowth of the hearings of the Sub-Committee of the Committee on the Judiciary of the United States Senate in April of 1926.

Professor Fisher frankly states that he formerly was opposed to prohibition but that he has been gradually forced to the conclusion that prohibition is the only solution of the liquor question. That prohibition, which prohibits but little, has already done good, he says, is shown by the fact that there are fewer new recruits among drinkers than in pre-Volstead days. He shows most conclusively that statistics, as presented generally by the opponents of prohibition, are falsified, or at least made to tell untruths. He shows that the personal liberty leagues are composed chiefly of the brewery and liquor interests. And of the industries, he says: "The simple truth is, prohibition has replaced a parasitic industry by constructive industries."

Of personal and social liberty he quotes from Senator Borah; "The man in the automobile may be opposed to the eighteenth amendment, but he will instantly discharge a drinking chauffeur. The train may be crowded with delegates to the anti-prohibition convention, but they would mob the engineer who would take a drink while drawing his precious freight. The industrial magnate may talk critically of sumptuary laws, but he will apply them like a despot to the man who watches over the driving power of his vast establishment. When safety is involved, we are all dry. Where the exigency of modern life demands a clear brain and instant decision in order to save thousands of lives and millions of property, we are all drys."

In the chapter entitled the "Social Good," there are numerous statements such as "Twice as many children today would be victims of improper bringing up because of liquor, if the dry law were not effective." Fifty per cent of the aid required in homes was because of drunkenness and this cause has now dropped to one per cent of the total.

The tactical error, Prof. Fisher thinks, has been in dropping the educational program and using a mere law enforcement program. He thinks that certain facts should be general property, for example the following: The influence of alcohol in typewriting efficiency was tested by Dr. Walter R. Miles. The typists generally thought the alcohol made them work faster and better, but Dr. Miles found, by actual tests, that without exception there was decreased efficiency. The number of strokes was decreased 2.6 per cent; the errors increased 39.3 per cent and the illegibility increased 55 per cent. One insurance company found that among its policy holders who used two glasses of beer or one glass of whiskey daily, the death rate was eighteen per cent above that among insured lives generally. Another company found the actual mortality among abstainers to be 65 per cent of the expected, whereas that for non-abstainers it is 90 per cent of the expected.

Regarding the proposition of light wines and beers, he says they are intoxicating by nearly unanimous testimony and hence cannot be allowed without modification of the amendment. Regarding modification of the amendment he says to have the answer, it is only necessary to reflect that before national prohibition came, thirty-five

states had already adopted state prohibition and that only thirteen states are needed to block repeal of the eighteenth amendment.

The question is propounded: "Is there any "Wet" optimistic enough to imagine that he and his friends can convert all but thirteen states to his way of thinking?"

The average man, Fisher says, is generally sure that alcohol is a stimulant, that beer and light wines are healthful, that his thirst for them is natural and that most persons can use liquor in moderation; all four notions have been proven false. Men who have lived in Kansas know that it took a quarter of a century for prohibition to accomplish much there and so it will take time to be really efficient in the nation.

The greatest good can be accomplished by good example. Instead of a slogan of Personal Liberty, which is license rather than liberty, let it be "Better Boys and Better Business," as it has been in Kansas. It is well worth waiting for.

Prohibition is here to stay. Its full results will be attained by education.

Professor Fisher's book is well worth the time of all persons interested in the liquor question; every thinking person of the nation should be interested in the question; for what we do now will affect our great grand children most happily or most unhappily. Act wet, if you must, vote dry and be a hypocrite, if such it is, for the sake of future generations. At any rate read this little book and be informed on the subject.

Sixty Years in Medical Harness, or the Story of a Long Medical Life, 1865-1925, by Charles Beneulyn Johnson, M. D., author of Muskets and Medicine, Medicine in the Fifties, etc.; introduction by Victor Robinson; Medical Life Press, New York, 1926; $3.00.

The Medical Life Press is doing commendable work in preserving historical data of medicine. Six books have already been published.

Dr. Johnson was born in 1843. He came into touch with medicine first in 1865 as a hospital steward with an Illinois battalion. There was then no thought of sanitary measures as we know them today. The study of medicine consisted of reading medicine in a preceptor's office and then going to lectures for a few months each winter for two years. Between courses it was the custom for students to practice. This Dr. Johnson did. His period between courses lengthened out to several years.

His first course of lectures was taken at the University of Michigan. The second was at the Ohio Medical College of Cincinnati. Dr. Johnson tells of his college professors—of their foibles and of their virtues. He tells also of leading medical men of the world for the latter half of the nineteenth century. His story of antiseptic surgery, the germ theory of disease and the many other medical innovations during his life make an entrancing story.

His intimate experiences, first as a student at Ann Arbor, and then in Cincinnati and as a practitioner on the prairies of Illinois, are interesting to the extreme.

Many intimate and personal touches occur all through the book. Dr. Johnson spent many pleasant days and, likely, nights writing this book. The reviewer spent a number of evenings most pleasantly in the reading of it. The physicians and others through the land who are interested in medical history will certainly do the same and then put this book in their collections.

We wish to extend to Dr. Johnson congratulations, for a long life, on a successful life, for it has been unusually useful, and on having written this book.

AMERICAN COLLEGE OF SURGEONS

The American College of Surgeons Regional Meeting of the Intermountain States will be held in Pueblo, Colorado, April 1st and 2nd.

An interesting program has been arranged. Clinics will be held at all the Pueblo hospitals in the mornings. A scientific program will take up the afternoons.

Drs. Kreuscher and Hedblom, of Chicago will be guests of honor on the scientific program. Each of the states of the intermountain region will also be represented. In the evenings official representatives of the College from Chicago will give addresses illustrated by motion pictures.

All members of the profession are earnestly invited to attend.

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